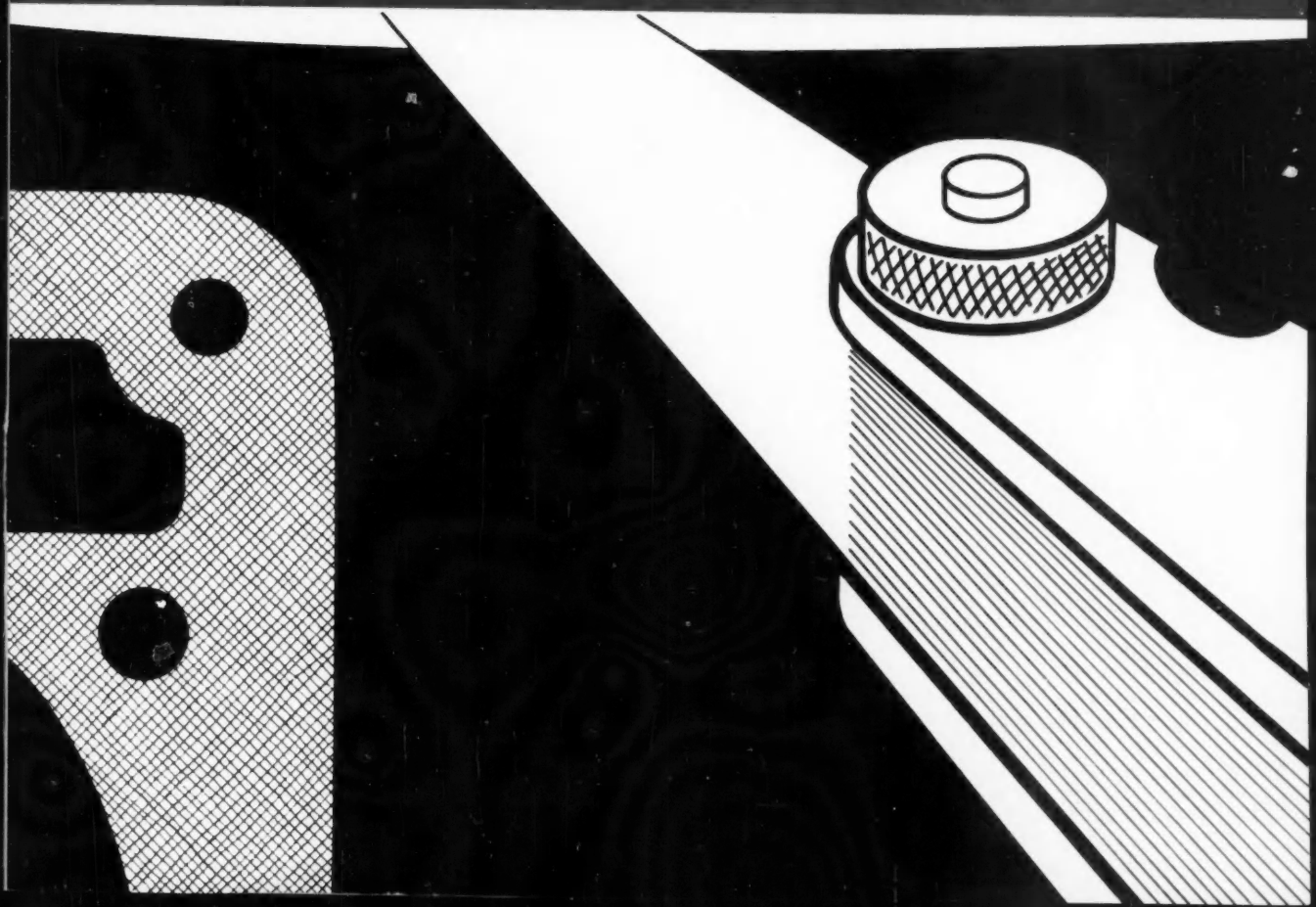
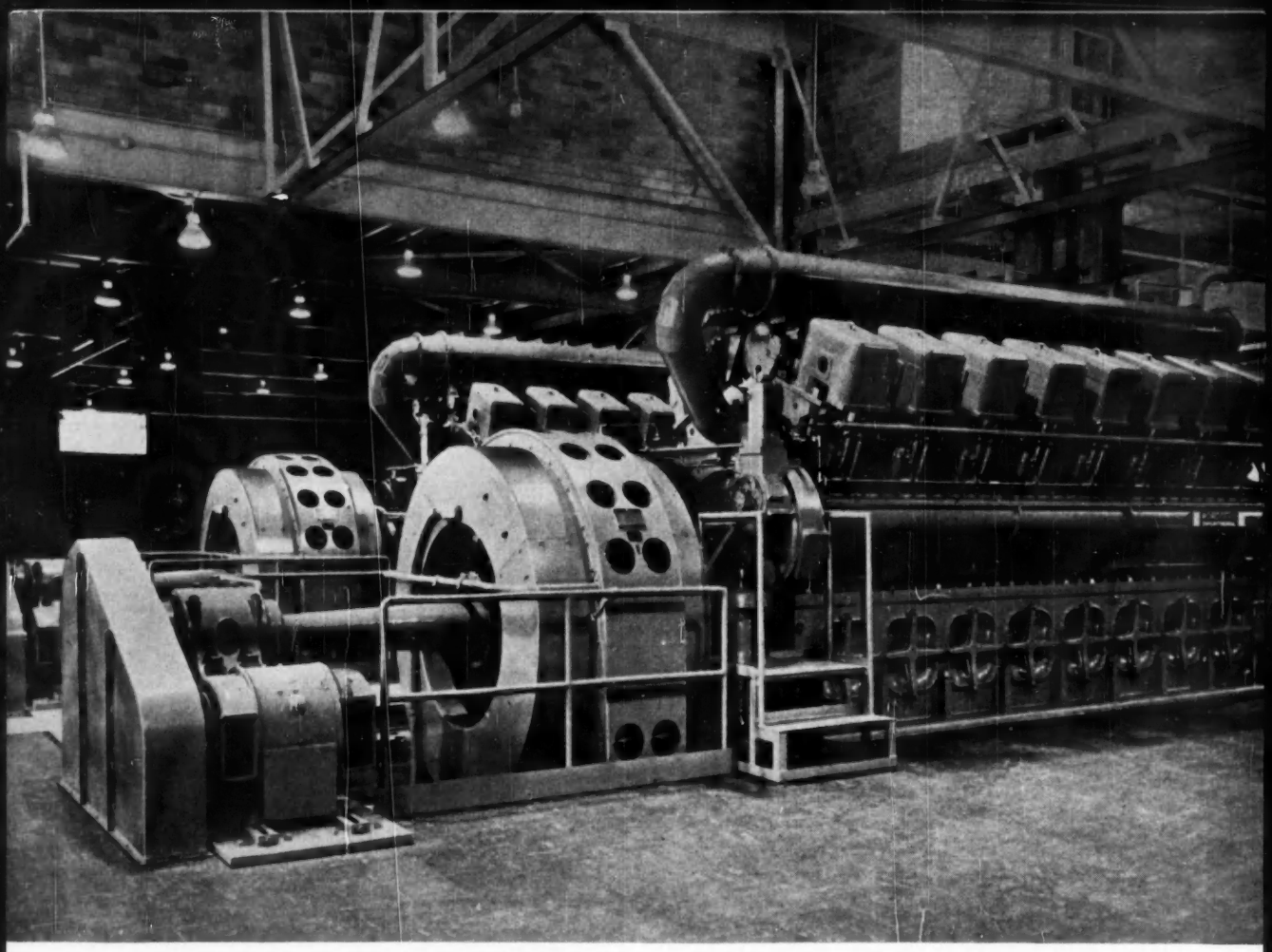
diesel power

February 1959





Texaco Ursa Oil lubricates each of these V-type 16-cylinder diesels which supply standby power in Narragansett Electric Co.'s Westerly, R. I., plant.

Bore and stroke of each engine is 13 x 16½"; each is rated at 3,500 hp at 514 rpm. Each generator has a net rating of 2,500 kw.

Texaco Ursa Oil protects Narragansett's reserve power

Narragansett Electric Company uses these two Supair-thermal V-16 diesels for standby power. It's essential that these engines be instantly available, even after long periods of idleness. That's why Narragansett uses Texaco Ursa Oil to protect engine power, keep it reliable and ready—anytime.

With Texaco Ursa Oil in the crankcases, Narragansett engineers are certain of getting full rated horsepower because Texaco Ursa Oil keeps rings free and prevents the formation of harmful deposits. And because Texaco Ursa Oil is a premium quality lubricant, it protects against wear, minimizes operating and maintenance costs.

There is a complete line of Texaco Ursa Oils refined and processed especially for the lubrication of diesel, gas and dual-fuel engines. In fact, *for over twenty-years, more stationary diesel horsepower in the United States has been lubricated with Texaco than with any other brand.*

Your Texaco Lubrication Engineer offers his years of experience to help you select the right Texaco lubricant for your needs. You can contact him by calling the nearest of the more than 2,000 Texaco Distributing Plants, or by writing: The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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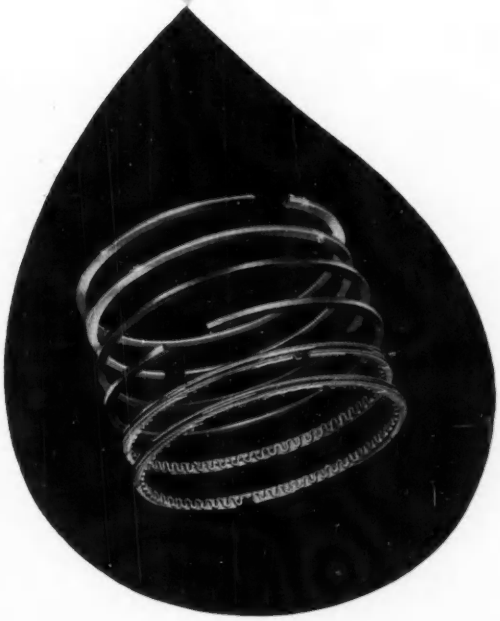
(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

why "Precisioneered"

PEDRICK PISTON RING SETS

Improve Diesel and Gas Engine Performance!



PEDRICK Piston Ring Sets for diesel and gas engines are "precisioneered" to assure maximum power with minimum oil consumption, to most effectively seal against blow-by, to deliver the greatest number of hours of efficient performance at lowest operational and maintenance costs.

The rings in a PEDRICK "Precisioneered" Set are individually designed to assure users coordinated *team* action. The assembled set is tailor-made for *unitized* action in the specific engine.

That's why PEDRICK Engineered Sets are used as original equipment in practically all leading heavy-duty diesel and gas engines . . . and why when replacement rings are installed, PEDRICK Engineered Sets are specified by most maintenance men.

Complete Sets . . . or open-stock rings, you get improved performance, more economical operation when you specify PEDRICK Piston Rings. And remember, if you have any kind of a ring problem, you can count on us to help you solve it. Write, wire or phone: WILKENING MANUFACTURING COMPANY, Philadelphia 42, Pa. SAratoga 9-3770. In Canada: Wilkening Manufacturing Co. (Canada) Ltd., Toronto 2.

Pedrick PISTON RINGS

PEDRICK PIONEERED Conformable RINGS FOR BIG BORE ENGINES

SIOUX impact offer Torque

SIOUX Electric IMPACT WRENCHES

Sioux electric impact wrenches offer equal power in right or left hand rotation. The torque for each wrench is stated and certified. Their mechanical design offers exactly the same advantages as that of the air wrenches. Their exclusive reverse cap switch lock prevents reversing with the current on, and eliminates burning commutator brushes and switch contacts. They are unexcelled in performance.

BIG "SLUGGERS!"

The SIOUX No. 320 and 322 air impact wrenches achieve a new high in power to weight ratio. Certified torque as shown in specifications with 8 points of power selection makes them most ideal for heavy duty work.

More than MEDIUM!

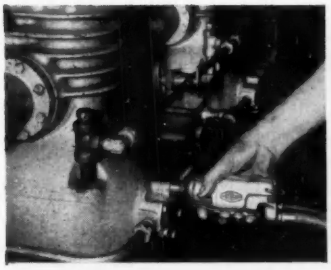
No. 315 and 316 are popular industrial and general use sizes with great versatility of use and power for extra punch. They're designed for use where power is required beyond that of conventional ½" drive wrenches.

Medium POWER

No. 315 and 316 cover a torque range adequate for many purposes. They're thoroughly tested and proven. Thousands are in daily use.

wrenches

for every task!



CERTIFIED SIOUX POWER

SIOUX tells you the torque your air or electric impact wrench will deliver. (See specifications.) You don't buy just a wrench. You buy certified SIOUX power! Reversible power. And on air wrenches controllable power through eight point power selector.

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Here, the advantage of the exclusive SIOUX mechanical design is revealed! You can expect your SIOUX air impact wrench to deliver *25% more torque* while *consuming 30% less air!* Less power is absorbed by the wrench itself. More is applied to the drive!

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The exclusive SIOUX impact wrench mechanical design has passed the toughest test of all . . . the test of time. Thousands have been giving dependable, trouble-free service for years.

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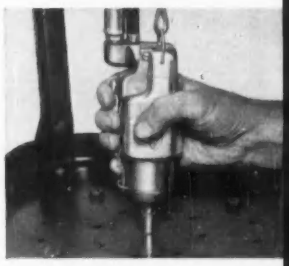
All SIOUX Impact Wrenches are "reaction balanced" for less vibration and torque feedback and for minimum operator fatigue. You can feel the difference!

ANGLE ATTACHMENT— used directly on the square of the impact wrench to reach those hard to get at spots.

Production type No. 313, 314!

AIR IMPACT WRENCHES

These models feature an exclusive remote air exhaust that takes exhaust 6 feet from the operator. Quiet, clean operation. Production type design with paddle switch, and 8 point torque selector.



No. 303 AIR IMPACT SCREWDRIVER

Same as above except takes ¼" hex drive shanks for clutch head, Reed and Prince, standard, and Phillips screwdriver bits, and for Allen type socket heads.

Compare the TORQUE! the QUALITY!

Cat. No.	AIR Square Drive	Cap. Bolt Size	Torque Ft. lbs. at 90 lbs. Air Pressure at Tool
313	3/8"	3/8"	60
314	1/2"	7/16"	75
303*	1/4" Hex		
315	1/2"	5/8"	130
312*	7/16" Hex		
316	1/2"	5/8"	195
317	5/8"	5/8"	195
318	5/8"	3/4"	250
319	5/8"	7/8"	425
320	3/4"	1"	750
322	1"	1 1/8"	1000

*AIR SCREWDRIVER

Cat. No.	ELECTRIC Square Drive	Cap. Bolt Size	Torque Ft. lbs. in 10 sec. operation Right or Left
323	3/8"	7/16"	75
333	1/2"	7/16"	75
325	1/2"	5/8"	125
330	1/2"	5/8"	175
335	5/8"	5/8"	175

ALSO NO'S. 260, 262, 242, 246 ELECTRIC SCREWDRIVERS

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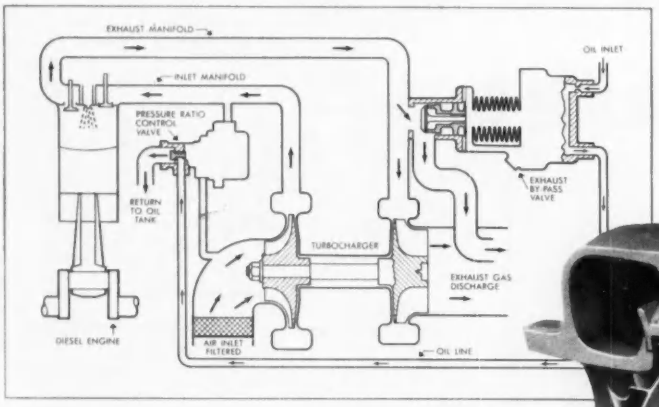
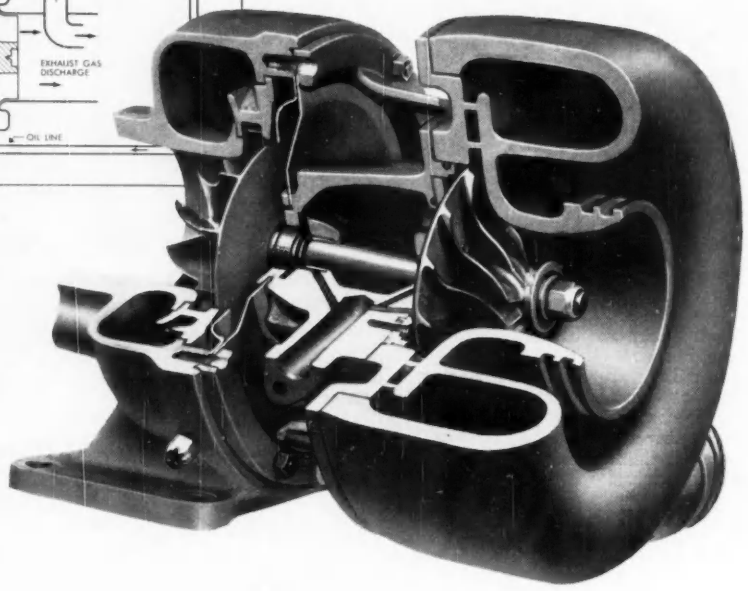


Pressure ratio control valve

Exhaust by-pass valve



AiResearch Industrial Division has made these vital contributions to the diesel industry

- provides the most economical turbocharging of diesel engines 50 to 700 H.P....
- designed and manufactured the first successful air-cooled turbocharger...
- built the first pressure-ratio control system to keep the turbocharger operating at peak efficiency continuously...
- developed the "free vortex" principle to replace the vaned nozzle, substantially decreasing the cost of small turbochargers...
- uses compressors with exceptionally broad characteristics to give best efficiency over a wide range of engine operation...
- has delivered more than 20,000 turbochargers in the last five years...
- currently turbocharges more than six million horsepower in diesel equipment...
- sells turbochargers and turbocharger control systems to 21 major engine manufacturers.

Your inquiries are invited.

THE GARRETT CORPORATION

AiResearch Industrial Division

9225 South Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS

editors notes...

You'll want to read about...

What a cab fleet owner wants and thinks about diesel power for taxicab service (Pg. 16). There's real honest-to-goodness interest in diesels for this application. Since the article was written, arrangement has been made for another make of engine to be installed in one of his cabs. It's a coming field and will be a big one . . . .

About one contractor who feels that the additional cost of premium diesel fuel pays off for him in longer dependable service life between overhauls (Pg. 20). While it is generally poor policy to use any better fuel than is needed, this contractor feels that it's good insurance for keeping jobs on schedule . . . .

Another application for low-cost dependable diesel power (Pg. 21). Distillation is often the only solution to the problem of getting clean, fresh water in water-hungry areas and since this takes power, it's a job for diesels . . . .

More production in less time with diesel power (Pg. 22). Here, diesel-powered equipment sets a new record in laying concrete for highway construction . . . .

New ideas in air filtration (Pg. 24) that overcome the problem of quick plugging of dry-type air cleaners. Efficient centrifugal precleaning reduces load on the final paper element. High efficiency is maintained for longer periods and servicing is simplified.

diesel power

Established in 1923 **Vol. 37, No. 2** **February, 1959**

The Magazine of Piston and Turbine Power

Editorial

A Big Chance — Right Now 13

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Diesels Cut Water Distillation Costs 21
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Diesel Publications, Inc., 80 Lincoln Avenue, Stamford, Conn.

You'll want to read about

A portable test kit worked out for railroad use (Pg. 26). Ability to check out injection nozzles right on the engine saves a lot of time . . . .

Design problems in developing a diesel generator set to provide uninterrupted power and how they were met (Pg. 28). Many new operations, civilian and military, cannot tolerate power interruption. Here's one answer . . . .

How a railroad solved the messy and tedious airbox cleaning problem (Pg. 30). Ports and liners were sealed off by simple covers to permit solvent spraying . . . .

New test equipment for measuring smoke intensity (Pg. 32). Smoke is an indication of abnormal engine operation. Also, in many areas it is a public nuisance, punishable by fine. So a smokemeter for test bench and field use can be a maintenance tool and can keep you out of trouble . . . .

Another job well done by a front-end loader (Pg. 33). If you haven't thought of this one keep it in mind; it could get you out of a fix. Here, a crawler-type loader places concrete for footings, getting through where other vehicles couldn't.

Be sure and read the editorial and the lead story. If we can get diesels into taxicabs and then light trucks, the diesel industry will grow rapidly. More engines, more parts, more service, more everything. We predict it's coming. Talk it up and help it along.

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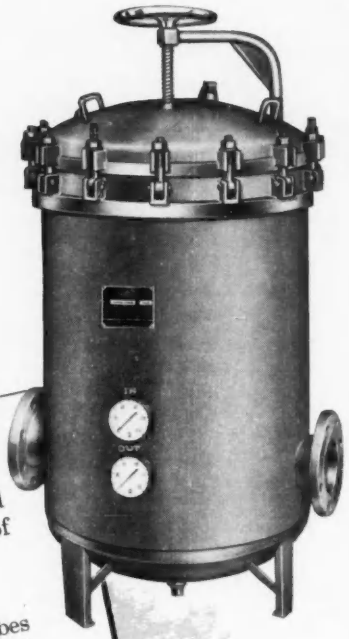
Check engine wear!

GET LOW-COST MICRO-CLARITY OF FUEL AND LUBE OILS



FULFLO FILTER. New WG high capacity model with optional cover-lifting device.

Full-Flow Filtration: Fulflo Filters pioneered — and are still the leaders — in providing *full-flow* filtration of diesel fuel and lube oils.

Depth Filtration: Genuine Honeycomb Filter Tubes provide true *depth* filtration through precision controlled tunnels engineered for uniformity of size, shape, depth and density. You get the advantages of both absorptive and adsorptive filtration with Honeycomb Filter Tubes.

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For complete literature, write to Department DR.

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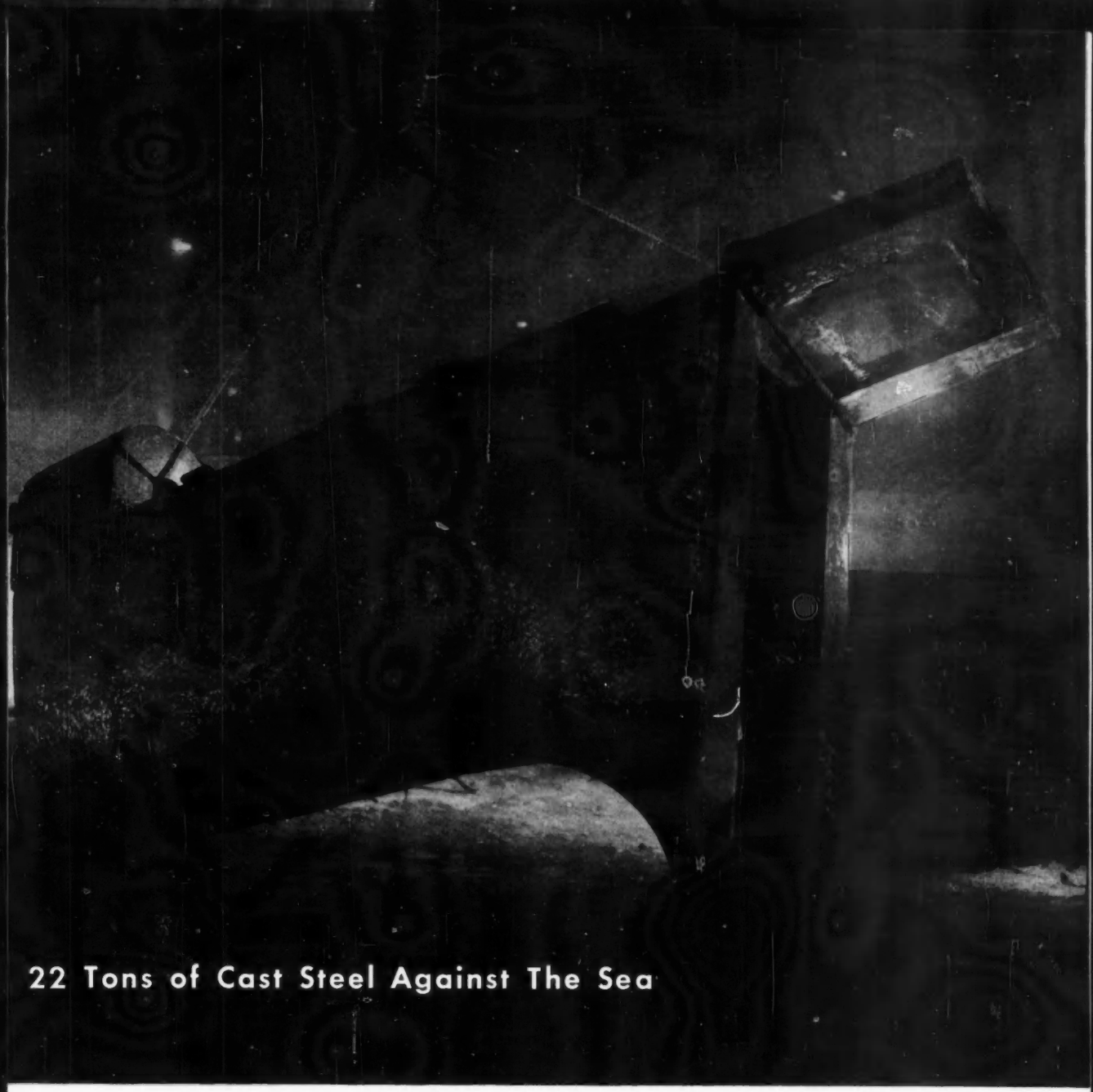
Fulflo FILTERS — *with genuine Honeycomb Filter Tubes for controlled micro-clarity of industrial fluids.*

CFC FILTERS — *Selective filtration of oils • water-oil separators • magnetic separators • pre-coat filters • coolant clarifiers • automatic tubular conveyors.*



22 Tons of Cast Steel Against The Sea

ERIE FORGE & STEEL cast steel ship's stern frames meet and beat the stern challenges of the seven seas . . . steel castings bred and born to survive Neptune's furious tempers against maritime and naval shipping. Like the men who for centuries have mastered the sea, these cast steel components boast the rugged strength, the inborn quality to win the coveted "well done" on every voyage.

Casting and forging dependable ship's components and vital parts for industrial machines is a long-time habit at Erie Forge & Steel. A habit combining strict quality control from raw materials to finished casting, long experience in producing steel castings to exacting specifications, modern metallurgical, engineering and production methods . . . Procedures that assure the results you expect. Consult with us.

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ERIE, PENNSYLVANIA

MEMBER AMERICAN IRON AND STEEL INSTITUTE

Unique packing retention method eliminates test rings

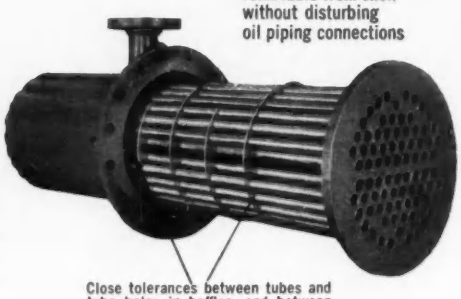
simplifies inspection and servicing reduces maintenance time

Paracoil

TYPE "PC" | EXCHANGER

Straight-tube exchanger for oil, water, air or gas

Tube bundle easily removable from shell without disturbing oil piping connections

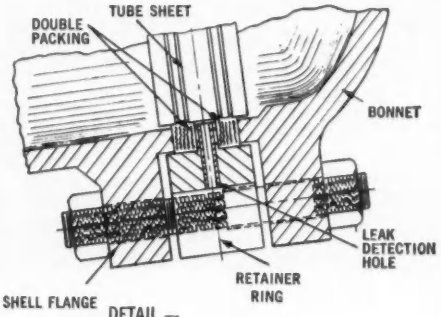


Close tolerances between tubes and tube holes in baffles, and between baffle periphery and shell, assure maximum heat transfer.

Exclusive "retainer ring" design, available only in Paracoil "PC" Exchangers, **permits shell side pressure test with bonnet removed. No auxiliary equipment or special devices are required to hold tube sheet packing against pressure.** By backing off only one set of nuts, bonnet may be removed without displacing packing or retainer ring. Pressure may be applied to shell side to test for defective tubes or leaking tube joints. With bonnet off, retention studs hold retainer ring and packing in place.

Leak detection holes in retainer ring show leakage from either tube or shell sides (See detail below).

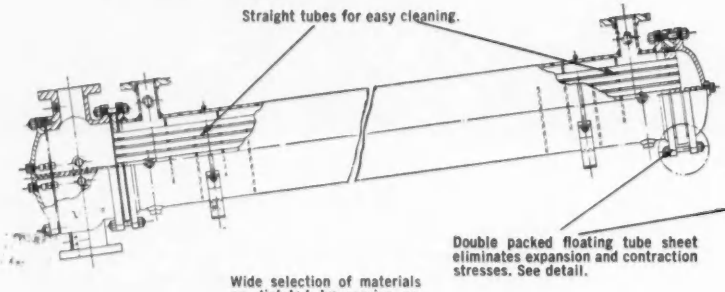
Tubes may be tested, re-rolled, even replaced, without removing tube bundle from shell.



DETAIL —

Section thru floating tube sheet showing packing and detection hole in retainer ring.

Straight tubes for easy cleaning.



Double packed floating tube sheet eliminates expansion and contraction stresses. See detail.

Wide selection of materials as dictated by service requirements.

Standard commercial, ASME or Marine Code construction.

HOW IT WORKS

Mixing of shell and tube side fluids due to packing failure is impossible in this Paracoil Type "PC" design. Any leakage from either side, resulting from loosening of bolts or worn packing, escapes through the detection holes. The operating personnel is thus on notice that servicing is required.

Paracoil
HEAT TRANSFER EQUIPMENT

Write for descriptive Bulletin 140

Since 1915

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30 Rockefeller Plaza, New York 20, New York

Preventive Maintenance At Work

"Our 40 million miles of experience with Purolator Air Filters has saved us thousands of dollars in engine repairs."

says Mr. Mel McClure, Shop Supt.
Yellow Transit Freight Lines, Inc.

The Yellow Transit Freight Lines, Inc. uses Purolator AF-50 dry-type Air Filters in all 302 of its fleet of Kenworth line haul tractors.

As a result, they have practically eliminated damage caused by dirt in the engine . . . reduced engine down time to a minimum . . . and saved thousands of dollars in maintenance.

To accomplish these major economies in time and dollars, the air filter is cleaned at each 8,000-mile P.M. inspection. In this way, each air filter is used for 32,000 miles before being discarded. "As a result, dirt is kept out of the Turbo Charger and combustion chamber, which is what we want for longer engine life. We'd rather clean the filters more often, than to have dirt enter the engine," says Mr. McClure.

This is another example of how leading fleets protect equipment, save money, and improve operation profits with Purolator Dry Type Air Filters.

Without obligation, a Purolator Engineer will gladly demonstrate the economies and advantages of air filtration for your particular fleet requirements at your request.

Write or call . . . or send for free literature today.

MAIL THIS COUPON TODAY!

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Yes, I want more information about dry-type filtration for fleets.

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Actual photo of a #6 residual fuel of the type burned regularly by two *Enterprise* Engines at the Municipal Power Plant, New Smyrna Beach, Florida.

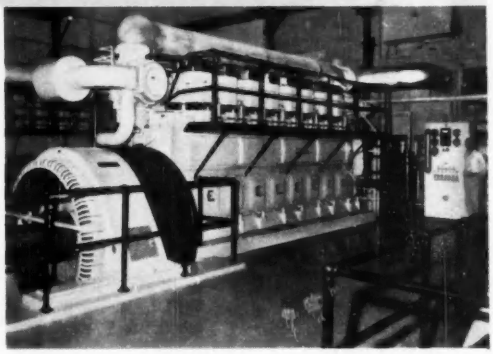
ENTERPRISE Does —and saves this city up to $4200 per month in fuel costs!

Here are facts of interest to any city that is thinking of using low cost residual fuels in engines for electric power generation.

Early in 1957, New Smyrna Beach, Florida put two DSR-38 *Enterprise* Diesels into operation generating 90% of its power load. They burn about 100,000 gallons of #6 residual fuel every month. *Both engines have now run on 80% average load continuously for over a year and a half without shutdown except for normal maintenance—with fuel savings as high as $4200 per month!*

This performance is typical of *Enterprise* Diesels. For they are designed and built to permit the widest possible latitude in fuel use. You can now order your new engine fully equipped for burning residual fuels. Or your present *Enterprise* Diesel can be converted to handle heavy fuel by installing the necessary oil heaters and centrifuges. No change in the basic fuel injection system is required if it's an *Enterprise*.

To be sure your diesel will handle low cost fuels and still turn in maximum performance—*without expensive maintenance and downtime*, specify Enterprise—custom crafted by the engine people that have the heavy fuel experience—and know how to use it!



These two 2500 HP *Enterprise* Model DSR-38 Turbocharged Diesels have turned in record performance on heavy fuel operation. Simple *Enterprise* open-type combustion chamber design makes handling of heavy fuels easy and economical.

ENTERPRISE
engine & machinery co.

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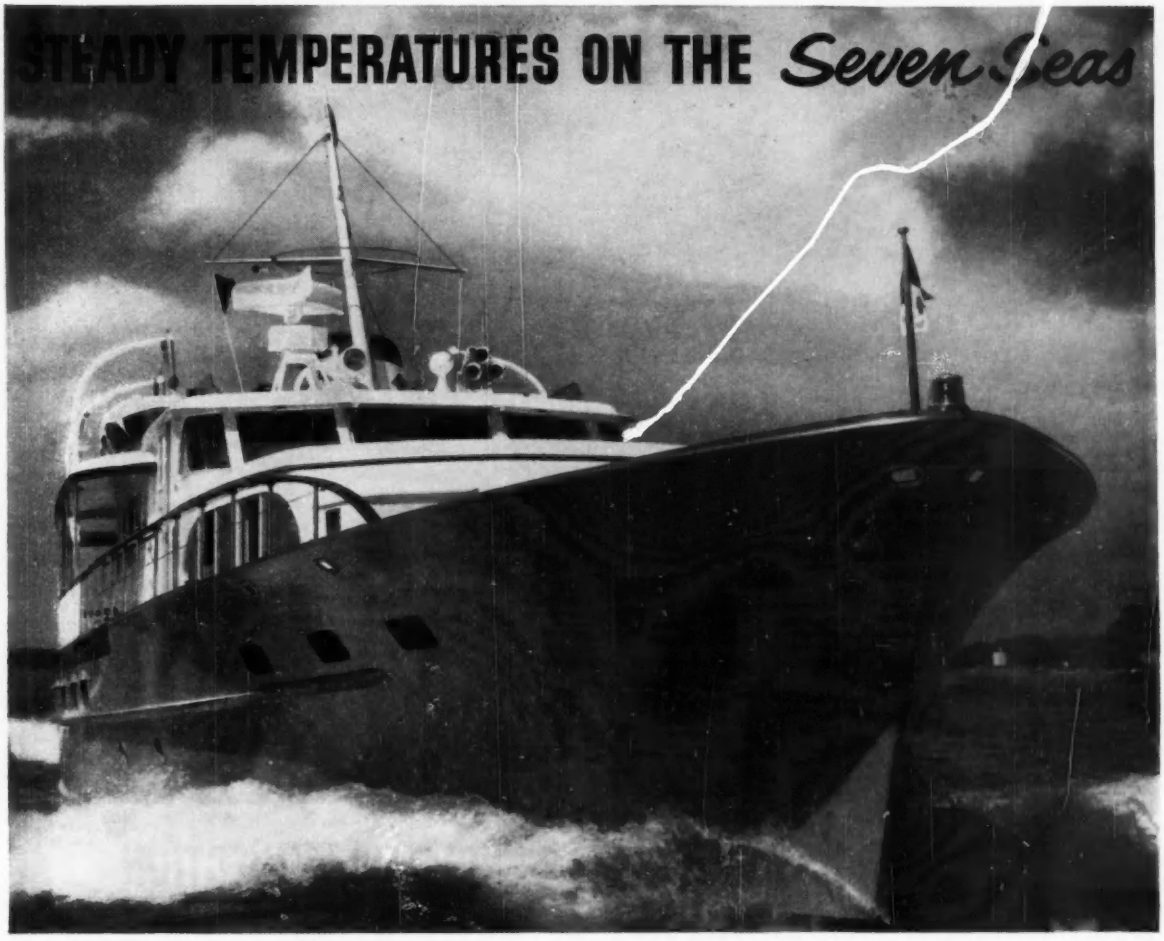
STEADY TEMPERATURES ON THE *Seven Seas*



GM HEAT EXCHANGERS COOL ONE OF AMERICA'S LARGEST LUXURY YACHTS— HAS 1400-MILE CRUISING RANGE WITH HARRISON-COOLED DIESEL POWER!

Harrison Heat Exchangers —Top-Quality Products of General Motors Research and Engineering.

Harrison keeps temperatures shipshape on the *Seven Seas*. The engine oil for the two powerful GM Diesels aboard this fabulous 90-foot pleasure cruiser is cooled by Harrison. From full power to leisurely cruising, heat's never a problem. Harrison heat exchangers are backed by General Motors' engineering and research, and more than 48 years' experience in the manufacture of top-quality heat-control products. That's why Harrison heat exchangers are specified on all types of the finest Diesel equipment—marine, industrial and automotive. If you have a cooling problem, look to Harrison for the answer.

TEMPERATURES MADE TO ORDER

HARRISON

AIRCRAFT, AUTOMOTIVE, MARINE AND INDUSTRIAL HEAT EXCHANGERS

GM GENERAL MOTORS

HARRISON RADIATOR DIVISION, GENERAL MOTORS CORPORATION, LOCKPORT, NEW YORK

With 34′ beam and 3½′ draft, the M/V *Yukon* cruises easily at 12.5 knots while towing 600-ton oil barge along the 2,300 mile course of shallow but swift waters.

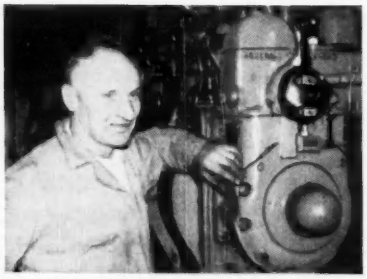
ALASKAN TOWBOAT USES BENDIX FUEL INJECTION TO OPERATE ALL SEASON LONG

Because the tricky Yukon River is open only four months a year, towboats must operate day and night if the tight freight schedules are to be maintained. Dependable performance is the reason Bendix* Diesel Fuel Injection equipment is in use on the 120′ steel-hulled, twin-screw M/V *Yukon*, operated by the Alaska Railroad.

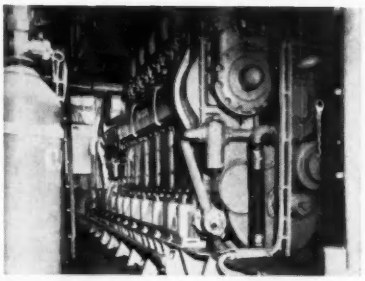
Chief Engineer of the *Yukon*, Carl Hagen, gives full credit for top towboat performance to his two Enterprise Model DM6-6 diesels equipped with Bendix Fuel Injection. Mr. Hagen reports: "Easy starting, fast response, low maintenance, economical operation as well as complete dependability."

In our new 49th state, as throughout the world, wherever the job requires dependable performance with low operating costs Bendix is the choice for fuel injection equipment.

*REG. U. S. PAT. OFF.



Chief Engineer Carl Hagen has logged 6,000 hours with his Enterprise diesels and never an hour lost.



One of the twin hydraulically controlled 6-cylinder Enterprise 12" bore x 15" stroke diesels, rated 600 HP at 600 RPM.

Scintilla Division
Sidney, New York

Bendix
AVIATION CORPORATION

Export Sales & Service: Bendix International Division, 205 E. 42nd St., N. Y. 17, N. Y.

Editorially speaking -

A Big Chance—Right Now

Let's take the kid gloves off. We've talked up diesels for small commercial vehicles for some time. We've promoted this idea editorially. We bought a diesel car to test the practicality of such application. We've talked to everyone who would listen—engine builders, users—and reactions have ranged from polite attention to mild interest and tentative agreement. The hell with that; it's time to do something. The lead story of this issue indicates the extent of interest in one area and in one service—taxicabs. Read it; it's a real challenge to our industry. If engine builders really believe in their product for this service (some have flatly said so), they'd do well to accept the challenge. Crack the taxi market, then the lighter trucks. The engine sales potential is enormous and worth spending some money to develop. It won't be easy; nothing worthwhile ever is. And it's later than you think. Last week, New York cab owners had a chance to see and drive a factory-fresh Plymouth cab with Perkins diesel power. This is nothing new to Perkins or the Chrysler overseas operations. But this is here. The cab is available, fully-engineered, and at a price well within reason. Consider the implications. Perkins is a competent engine builder with a production volume probably more than double that of our largest producer of diesels. They are a major international supplier to Chrysler, Ford, General Motors, International Harvester, Allis-Chalmers and others. As evidence of further American interest in this company, Massey-Ferguson has offered to buy all the 5,200,000 issued common shares of Perkins. There's a real grassroots interest in a new field of diesel application (in this country), based on economic pressures. Someone's going to fill that need. Things are just getting started and if any engine builders want to get into the act, now is the time. There's a big potential market to be won—or lost by default.

BPE

highlights

Sales for 1959 should be good for farm, power and industrial equipment according to Allis-Chalmers and construction machinery sales should continue to improve.

Construction outlays for 1958 topped $49-billion. A further rise to $52-billion is expected in 1959. This increase will mean greater work load for existing construction equipment (higher parts sales) and call for new equipment.

Buy now says R. G. LeTourneau. He considers many contractor's inventories are dangerously low. As equipment demand increases, and wages continue to rise, resulting inflation will make it necessary to pay higher prices to get inventories back where they belong.

A $7-million order for 119 turbocharged locomotive diesels has been received by the Cooper-Bessemer Corp. The contract is the largest single order for locomotive engines to be received by the company. The engines, were purchased by General Electric Co. They will power diesel-electric locomotives for the South African Railway.

Trucking industry paid nearly $2.5-billion in highway user taxes in 1957 according to the Research Dept. of the American Trucking Association, Inc. This is $227-million over 1956, and 10 times more than it paid 25 years ago when ATA was founded.

Optimism for 1959's business outlook is reflected in the Santa Fe's purchase of 42 2400-hp diesel locomotives and 626 freight cars. All are scheduled for delivery in 1959. Additional diesels and freight cars are under consideration for 1959. Also, 248 miles of continuously-welded rail will be laid.

In 1958, diesels powered 23.5% of all farm tractors, a 7% jump from 1957. This trend seems to be continuing too. Dealers of one company alone, the J. I. Case Co. have placed orders for over $200-million of agricultural and industrial machinery at Case's annual new line showing. A year ago dealers orders topped $150-million.

Railroad diesel fuel oil consumption in 1959 hit an all time of over 3.6-billion gallons according to the API. Total fuel bill for Class I railroads was about $460-million, 90% of which went for diesel, residual fuel oils and gasoline used in train service.

Best argument we've seen for rising torque converters in shovels and drag lines is a note at the bottom of some tables for estimating production. It just says that figures can be increased 10% for torque converter-equipped machines.

Fuel savings from 15 to 18% at idle and part-load are claimed for a modification to EMD unit injectors. Performance on economy-type fuels is also better. Several railroads are reported testing the modified injectors. Standard check valve and nozzle tip are replaced by a differential-type hydraulically-actuated nozzle of the type conventionally used in many other engines. Conversion is made with only minor machinery operations.

Another railroad is making a bid for more long-haul passengers through reduced rates. On the jointly-operated Chicago-Denver service of the Union Pacific and Milwaukee Railroads, these railroads are offering a single fare ticket replacing coach and first class fares. The ticket will be good for coaches, and upon additional payment, for sleeping accommodations desired.

A new national association has been formed. This one is for independent tractor parts rebuilders and parts manufacturers, suppliers and distributors. Rebuilding of worn tractor parts represents a fast-growing enterprise and since rebuilding can mean substantial savings, parts rebuilding is an important factor in American economy.

Total U. S. truck fleet will reach over 10.6 million this year according to a booklet entitled "American Trucking Trends—1958". In addition to large sums spent on replacement parts and other goods and services in 1958, trucking firms bought more than 900,000 truck and trailers, 14-billion gallons of fuel and provided employment for over 7-million persons.

BETTER FILTRATION BY FAR... AND THIRTY EXTRA DAYS BETWEEN CHANGES TO SAVE MAINTENANCE DOLLARS!

"Why do you claim only 30 days longer service life for WIX Prescription Filtration of Diesel Fuel?" asks a WIX user. *"Our filters have completed 60 days — the oil's as clean as a whistle and there's no pressure drop."*

WIX claims are on the conservative side. The team of WIX Primary and 2nd Stage Fuel Oil Cartridges provides big savings in filter cost per hour and labor cost servicing filters. But, these savings are only a drop in the bucket compared to what you save with WIX in elimination of Fuel Injection troubles, reduction in Diesel Engine wear and attendant loss in efficiency.

Here's an economy source you may have overlooked. Get the facts on WIX Lubricating and Fuel Oil Filter Cartridges. Write for the new WIX Catalog today.

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A Cab Fleet Owner Looks At Diesels

Here's a challenge and an opportunity for our industry. A New York taxi cab operator is seriously investigating diesel power for his cabs as a way to cut operating costs. Here are his thinking and requirements. Whoever gives him what he wants has a toe in the door leading to a big potential market.

"YOUR publication is most interesting and educational to me and others who are making serious study to ascertain the most appropriate diesel engine for our work." What work? The letterhead read "55th St. Taxi Garage Inc." and was signed by Mr. George Echelman. We've been strong advocates of diesels for use in taxis and light commercial vehicles so this was enough to get the Editor down there in a hurry.

We found that Mr. Echelman operated a fleet of 115 cabs. Also, that he was one of ten Directors of the Metropolitan Taxicab Owners Board of Trade representing fleets with about 4000 cabs. This is approximately one-third of all the cabs in New York City.

After the preliminaries of getting acquainted, we got down to cases. Here's how the interview went.

"Mr. Echelman, just what do you want?"

"It's simple; we want something to cut our operating expenses. We think diesel power can do it if we can get the right engine-vehicle combination at the right price. It would be ideal if we could get a factory-engineered cab with a diesel in it, even as a power option, for example the Mercedes-Benz passenger cars have a choice of engines—gas or diesel: $277 extra for the 180D or $327 extra for the 190D—at retail prices.

"We are willing to cooperate with any engine builder that thinks he has the answer. I'll supply the cab—one of my Checkers—and operate, maintain and evaluate performance in terms of taxicab needs. I think that the outfit that meets this need is going to sell a lot of engines for this service, to operators and on a factory to factory basis."

"Are you convinced that a diesel will give the performance you need?"

"Yes, and without too much horsepower. You're driving a Mercedes-Benz 180D and you've seen some in cab service right here in the city. They do the job for the independent owner-driver but fleet needs are different. For example, we want an automatic transmission, others prefer the manual 3-speed transmission and heavy-duty clutch.

"We're not interested in high speed; most operation is at low speed and idle. We don't encourage fast acceleration. It leads to accidents, is hard on vehicle components and both run up costs.

"Chassis dynamometer tests on the Checker cab with the Continental gas engine we use show that we need only 30 to 35 horsepower at 45 mph. As a matter of fact, the first modification we make on a new cab is to install an adjustable stop under the accelerator pedal. This limits maximum speed and also cuts back maximum power in the upper part of the engine speed range. It also blocks the "kick-down" feature in the automatic transmission and saves us a lot of transmission and converter troubles. I mention this to show that we can do with less power. An engine in the 40 to 70-hp bracket, applied so as to be operating in its most efficient range at the vehicle speeds in which we do most of our running, would probably do the trick."

"Where do you figure to make most of your savings?"

"In two areas: (a) better mileage and (b) lower maintenance costs. I've looked at typical diesel and gasoline fuel consumption curves and it seems that we should save quite a bit since there is a wide spread between the curves down at the lower engine speeds where we operate a lot. How much we save, I suppose, will depend on the particular engine-vehicle combination. That's why we'd like to evaluate different equipment and desire manufacturers cooperation to provide suitable engines to test, select

from and to adopt for both replacement and original equipment.

"We are currently getting 100,000 miles or better on our Checkers with nothing more than plugs and points. Then, it's usually a matter of rod bearings, rings and a valve job. We would expect something better than this of the diesel engine. Some cabs we sent to Israel were there converted to Perkins diesels and are reliably reported to have gone 125,000 miles-trouble-free and still working."

"You say you want to evaluate to find the 'right' engine. Beyond performance, what do you want?"

"Ride a cab today and you pay the same as you did six years ago. Yet you know all our costs are up. This continual 'squeeze' dictates what we want. For example, we think an air-cooled engine would save us money. Take a look out here."

(Outside, cabs were lined up for the shift change. Each was being refueled, oil and water was being checked. Now back to Mr. Echelman)

"Right now it takes only a minute or so per cab to check the water but in summer it takes longer. Then there's the cost of anti-freeze. Worst of all, even minor front-end accidents in many makes of cabs shove the radiator into the fan or otherwise damage it. There's the cost of repairs, a tow to the garage and the cab is off the road. Hot air heaters—as in the Volkswagen—should cost less, and give less trouble than the hot water heater, with its hoses and electric motor blower.

We're going to take a close look at every engine from the viewpoint of simplicity and ease of servicing. No gadgets or complicated mechanisms. What we don't have on an engine can't cause us trouble. And remember, in fleet operation, little things can become very important. For example, I'd like to have a self-bleeding injection system. In the Perkins-powered cabs for Israel, the fuel system got air-locked when fuel got low and you went around a corner. The cab was dead until a mechanic could bleed the lines. It may be a little thing but it illustrates my point. We look at such things as the amount of external 'plumbing' around an engine that could give trouble and possibly ruin it.

"Let me ask you a question. What fuel injection system is going to cost us the least over the life of the equipment? This can be a high-cost maintenance item. I know that you won't answer but I'm going to find out. And if we can't get that system on the engine we want, we'll put it on. That's the way we have to work."

"What about parts and service?"

"Availability and parts pricing are going to be big items in selecting an engine. We just can't wait for parts. As for pricing, we'll have to investigate the different discount structures as they would apply to us. At present we have practically a factory-to-factory pricing arrangement. Our purchasing volume is bigger than a lot of factory-to-factory accounts.

"Just to give you an idea of our buying volume, our co-op buys 15-million gallons of gasoline a year. The volume of parts absorbed by all the fleets is fabulous. I haven't checked the way that the diesel engine builders work but I'll tell you one thing, if they want to get into and remain in the taxi field, they'll have to provide quality engines and parts at fair prices without high dealer and distributor mark-ups.

As to service, you and others in the diesel industry tell me I shouldn't have any major repairs for a long time. I'll assume that, but I do know that we will have some troubles. These will have to be handled in our shop. When it comes time for major overhaul, we don't want to waste the money we earned from diesel fuel economy on much more expensive overhauls."

"What about the vehicle?"

"I'm using Checkers. They're tough and though I pay more than for one of the Big Three's cars, they pay off. Take one thing. All fenders are separate panels and are simple. It's rare that we can't take one off, straighten it easily, paint it and put it back on. Some of those 'sculptured' jobs can cost you a fortune in bodywork.

"We keep a good record of fuel, oil and repairs. When any one of the three get out of line, we find out why. If we have trouble with a vehicle component, we'll change it to something better. I mentioned that we have to buy at rock bottom over factory cost, but don't get the idea that we won't pay for quality. The only thing is that the 'quality' product has to justify its cost."

"What have you done about diesels so far?"

"I've been in touch with some of the engine builders. This has mostly been through their representatives here in New York. There has been a lot of interest and some promises but so far only one program is definite. One of our cabs is in North Carolina being fitted with a Cerlist 2-cycle engine. We're waiting for it so that we can get some time on it and start evaluation. Also a Deutz air-cooled engine has been ordered and will be installed soon.

"In the meantime, I'm holding a cab without an engine so that any interested manufacturer can check dimensions, interference, and so forth. Incidentally, among the items we would consider in selecting an engine would be the way it fits the cab's space, its weight (this can affect steering and perhaps mean beefing up the front end) and how it goes with the cab's systems.

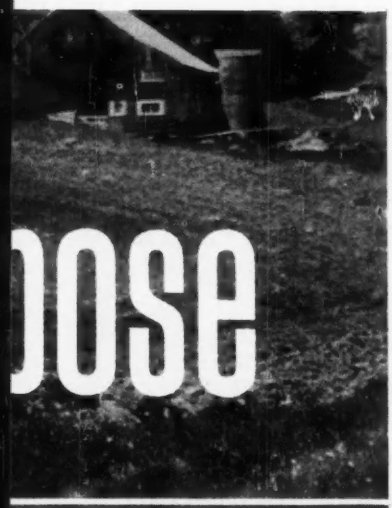
"For example, we've had excellent results with the Borg-Warner Detroit-Gear transmissions in our cabs. We'd hate to have to change them although other competent operators are op-

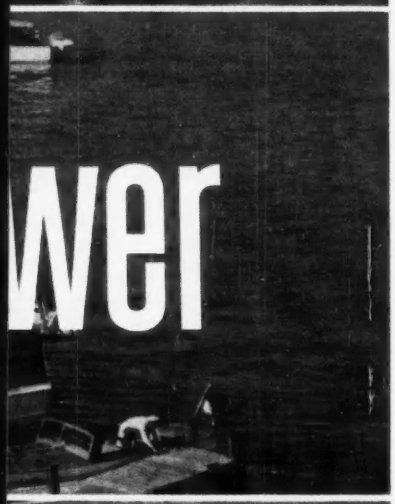
(Continued on Page 20)

THE GM DIESEL ALL-PURPOSE POWER LINE
20 to 1650 H.P.
in only 3 cylinder sizes

NON-TURBOCHARGED RATINGS

NEW		NEW		NEW		NEW
"2-53" 20 to 47 H.P.	"2-71" 33 to 67 H.P.	"3-53" 38 to 97 H.P.	"3-71" 51 to 118 H.P.	"4-53" 51 to 130 H.P.	"4-71" 69 to 167 H.P.	"6V-53" 76 to 195 H.P.	"6-71" 112 to 252 H.P.





The Series 53 "Jimmy" Diesel

Smaller and more compact 2-, 3-, 4-, and V-6 cylinder engines based upon the dependable GM Series 71 Diesel

New as tomorrow is the power concept which GM Diesel has embodied in its All-Purpose Power Line.

Using only 3 cylinder sizes, GM Diesel engineers have more than doubled the number of basic engines—vastly increased the horsepower range—yet maintained the famous GM Diesel family relationship and parts interchangeability.

This concept is dramatically illustrated in the Series 53 "Jimmy" Diesel. For *only* in these Diesels are combined *all* the profit-making, cost-saving advantages *any* Diesel has ever had.

Compare them horsepower for horsepower:

> They cost less, weigh less, take up less room. Accelerate faster, last longer, and parts cost less. They're easier and less expensive to repair and maintain—far more efficient, too.

All these advantages add up to high earning power and real operating economy. Put a Series 53 "Jimmy" Diesel to work. It will pay for itself amazingly fast when it takes over from a gasoline engine.

This Series 53 "Jimmy" Diesel is *literally* All-Purpose Power in the 20- to 195-H.P. range—marine, industrial, agricultural. Consider it for your needs. Write GM Diesel, Dept. B-2, Detroit 28, Michigan, and see what these new Series 53 "Jimmy" Diesels can mean to your profits—or your pleasure.

GM DIESEL

DETROIT DIESEL ENGINE DIVISION,
GENERAL MOTORS, DETROIT 28, MICH.

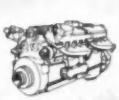
In Canada: GENERAL MOTORS DIESEL LIMITED, London, Ontario
Parts and Service Worldwide

NEW
"6V-71"
112 to 252 H.P.

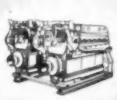
NEW
"8V-71"
150 to 334 H.P.

"6-110"
160 to 335 H.P.

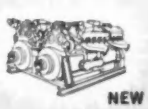
NEW
"12V-71"
224 to 504 H.P.



NEW
"16V-71"
300 to 675 H.P.



NEW
"24V-71" (Twin 12)
448 to 1008 H.P.



NEW
"32V-71" (Twin 16)
600 to 1350 H.P.
(Turbocharged—1650 H.P.)

(*Continued from Page* 17)

posed to automatic transmissions. Also, we like the 6-volt electrical system we're using. If we need 12 volts for diesel starting, we'll have to get into a series-parallel system. Some provision will have to be made for the vacuum needed for the brake booster system. This gives you an idea of some problems that must be worked out. Actually most makes now use 12 volts and not all use the power brake —so the problem is not universal."

"Mr. Eckelman, let me see if I can summarize your ideas. First, you think that diesels in taxicabs will give you the performance you need and will cut your operating costs. Next, as an owner of a fleet of 115 cabs but also as a spokesman for a group of fleet owners having approximately 400 cabs, you are interested in evaluating various diesels to find the right engine-vehicle combination for cab service. You will cooperate with engine builders, supplying the cabs, drivers, maintenance and keep all records needed for evaluation.

"As for the engine, you feel you need one in the 40 to 70 hp range. It must be rugged, simple, easy to maintain. Preferably, it should fit current vehicles like Checker, Ford, Chevrolet, Plymouth, Lark and Rambler with respect to size and weight and require a minimum of vehicle alteration.

"While you anticipate that costs of engines and parts will be somewhat higher, there is a limit to the premium cost if diesels are to be economically feasible. Also, pricing must follow the pattern already established in the automotive field wherein fleets such as yours work on practically a factory-to-factory pricing arrangement. "Is that about it?"

"Yes, and I want to thank you for getting this story across to your industry. We think that the diesel industry should get into the field with its huge potential for engine sales. Two-shift service in New York is one of the toughest cab services in the world. What happens in New York is watched nationally and internationally. Used New York cabs have been shipped to and are used in many foreign countries, where the desire for diesel economy is equally great."

Contractor Credits Good Operation, Low Maintenance To Premium Fuels

HERE'S a contractor who feels that use of premium fuel is paying off for him. He is willing to pay for a premium fuel because of the benefits he attributes to its use.

Ballanger Paving Co., of Greenville, S. C., credits the use of a high-quality fuel as the major factor in keeping on schedule and holding down operating costs. The Company points to an improved maintenance record plus better equipment performance to justify their slightly higher fuel costs.

These records show much less carbon deposits in the diesels powering their equipment than expected. The records also show that injectors are not fouling up as frequently as expected. The operators know that the engines are delivering full power for longer periods because they don't become sluggish. These benefits are all attributed by Ballanger Paving Co. to the cleaner-burning fuel.

In spite of tough going due to large outcrops of granite requiring blasting, this company is on schedule on a highway building project. Last May they were given 270 days to clear, grade and drain six miles of Interstate 85. This is a South Carolina section of the new 41,000-mile system of interstate highways.

The contract involves moving 1,050,000 cu yd of red dirt, sand, rock and granite. To do this, Ballanger Paving has 14 pieces of heavy earth-moving equipment on the job. These include two TS-24 Euclids, two DW-21 and three DW-20 Cat scrapers, three Allis-Chalmers crawler tractors, two Cat motor graders and two Cat crawler tractors.

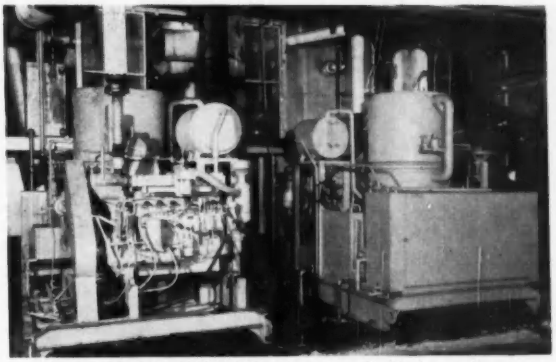
Though some 1500 gallons of fuel Gulf Dieselect are used each day in this equipment, filters and tanks need not be cleaned as often as expected. Deposits are not forming as anticipated.

Fuel delivery is no problem. Refueling of equipment takes place twice during the contractor's 11-hr day. Gulf keeps the tank at the job site filled and refueling is done with a minimum of lost time.

According to Ryan Graham, superintendent, many things can happen to throw a contractor off schedule and only a few can be controlled. One important factor that can be controlled is selection of a fuel specifically designed for today's hard-working, high-output diesels. This, according to Mr. Graham, though not the complete solution, is a worthwhile step toward maintaining tight schedules.

Diesels Cut Water Distillation Costs

Getting fresh clean water is a big problem — and growing. Compact self-contained, diesel-powered distilling units provide an economical source.



Two Model PD300K MECO 300-gph water distillation units on an offshore oilfield rig. Each is powered by an Allis-Chalmers 6DT-317 diesel and is 76-in. wide, 116-in. long and 90-in. high.

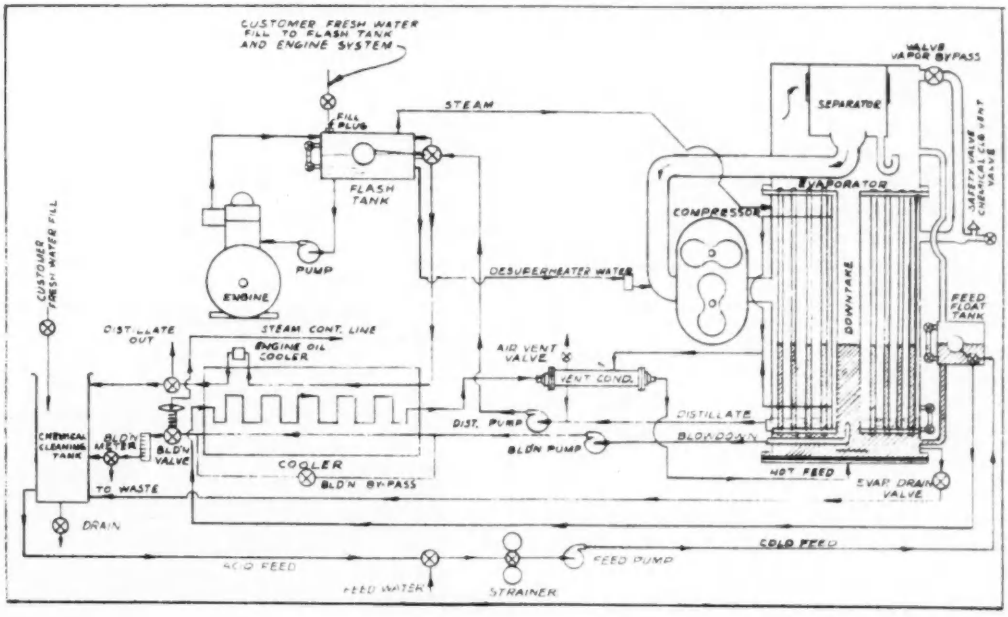
WATER distilling units are in growing demand for both industrial and military uses. If your problem is fresh, clear water—this is one of the most economic solutions. Where contaminated fresh water is available, the cost of treatment must be figured against distillation. The only other alternative is to haul fresh water long distances—an expensive project. When sea water is all that is available, distillation is the only answer. Distillation costs vary but when diesels supply the power as in the case of the unit to be described, they will be at rock bottom.

Hundreds of these distillation units are in service aboard ships, on offshore drilling platforms, in desert outposts, on airfields in the frozen north, and in many other arid and remote areas. They are used to produce fresh water for drinking, cooking, washing and industrial processes as well as for use with drilling mud.

Three basic types of water distilling units are generally used—engine-driven, electric motor-driven and electric/steam powered. Of these, the diesel-powered unit is by far the most popular. There are two reasons for this. First, it is a completely self-sufficient unit independent of any outside or auxiliary source of power. It can be set up in any location, no matter how remote. Second, the diesel provides cheapest power for operating the distillation unit. When more practical, these engine-driven units are powered by either natural gas or dual fuel engines.

Powering water distilling units is by no means a new application for the diesel engine. One manufacturer for

Flow diagram of a MECO diesel-powered water distillation unit.



example, the Mechanical Equipment Co. (Meco) has been making them since 1941, when they pioneered in the development of heavy-duty diesel-powered thermo-compression distillation units. Yet it is a specialized application and one not often encountered.

MECO units are built to customer specifications, however, they make standard stock units which use Allis-Chalmers diesels. The smaller self-contained units are ready to operate as shipped from the factory, requiring only connection of feed, distillate, and blowdown piping to the unit, etc.

MECO water distillation units are available in nine standard sizes, ranging from the small 15 gph-size, up to 2080 gph. Most units are shipped in one complete package, assembled on a steel skid or sub-base. Components are chiefly fabricated of non-ferrous materials.

All units are assembled and thoroughly te ted by actual operation prior to shipment. Large units are match-marked before disassembly for shipment.

In the case of these diesel-powered units, the "starting" and "make-up" heat required is furnished by heat given up by the diesel engine cooling system. This is accomplished as follows: Distilled water is circulated through the engine jacket and back up to a flash tank, where a portion of this water flashes into steam. (See flow diagram) This steam is directed to the evaporator heat-exchange surface. Heat from this steam, starts the evaporation process.

As feed water in the evaporator begins to boil, the resulting vapor is drawn off by the vapor compressor driven by the diesel. The vapor compressor shown is of the two-lobe rotary positive-displacement type. This or a centrifugal compressor are most often used.

This vapor is compressed and its temperature increased accordingly. This steam is directed against the outside of the evaporator tubes where it gives up the heat necessary to continue the evaporation process. The steam then condenses and falls to the bottom of the evaporator where it is then drawn off by a pump as distilled water.

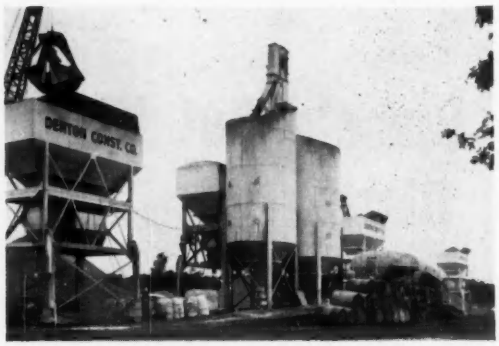
Correct level of cooling water for the engine system is maintained by a 3-way, float-controlled valve in the flash tank. This arrangement allows distilled water to enter the engine system to replace the amount lost by flashing.

After being "brought in" (that is, making water), the system is substantially self-sufficient. Heat balance is controlled by an automatic diaphragm motor valve which regulates the flow of water.

Starting time (period from time the engine is started until distilled water is produced) is about 30 minutes. Operator attention to the unit is required only during this starting period. From then on only to a small degree.

After distilled water is in production, unit operation is automatic and requires only minimum attention. It is protected by a number of safety control devices. These will shut it down on failure of certain components which might cause costly damage.

Efficiency of these thermocompression units is attractively high. It ranges from 250 to 1 (pounds of distilled water produced to pounds of fuel oil consumed) on the smaller units, to 300 to 1 on the larger ones.



Paving Record Set With Diesel-Powered Equipment

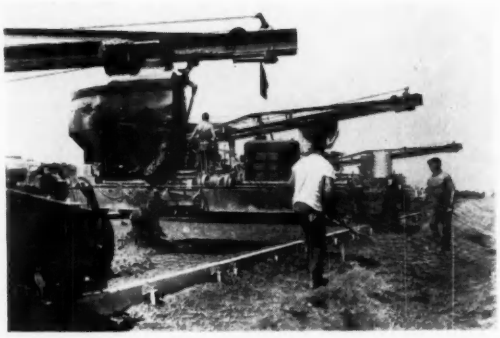
DIESEL-powered machinery plus a capable crew teamed up to set a paving record recently. In 12½ hours, 6029 lineal ft of 9-in., 24-ft wide concrete pavement was laid. This topped the old record of 5789 ft.

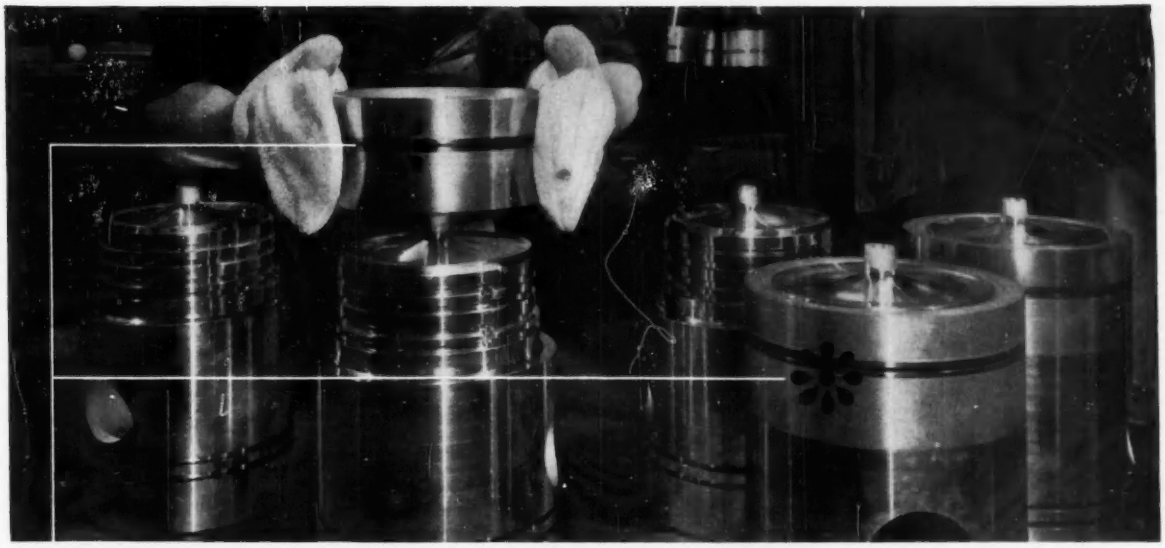
Scene of the record breaking event was a 9-mile section of new US highway 23 under contract to the Denton Construction Co. It is part of an overall program to widen US 23 into a 4-lane express route from the Ohio line to Standish, Michigan.

Denton's Butler portable, air-electric, batch-mixing plant, (above), a 3-member spread of Rex pavers (below), and 17 tandem-axled, 10-cu yd trucks, all diesel powered, was the key equipment used.

The portable batch-mixing plant, first of its kind in Michigan, has four discharge chutes per bin and adequate capacity to supply four pavers operating at full capacity. It is push button controlled. Power for all components, including the conveyor system, is provided by a 100-kw Detroit Diesel generator set. This is base mounted to facilitate moving. The plant is of unitized construction permitting added speed in erection and moving.

Each Rex paver is powered by a "4-71" GM diesel.





"Bonded-In" Ni-Resist Forms Top Ring Grooves. Because the thermal expansion of Ni-Resist matches that of aluminum, Ni-Resist inserts can be permanently bonded in. Bonding is by Al-Fin Process, developed by Fairchild Engine and Airplane Corp., Deer Park, L. I., N. Y.

Most Powerful Harbor Tug in the United States. Squat, pug-nosed Kings Point is powered by a 2100 HP ALCO diesel with forged aluminum pistons. All 16 pistons are equipped with Ni-Resist inserts at the top compression ring groove. The Kings Point operates out of Baltimore for the Curtis Bay Towing Company, Baltimore, Md.

Ni-Resist ring carriers keep her powerful new diesel powerful longer

Once ring grooves lose their shape, through wear, galling and heat, down goes compression, power and efficiency. To strengthen this critical point, pistons on the Kings Point's engine are protected with Ni-Resist* nickel cast iron in the top ring groove area.

Ni-Resist ring carrier inserts hold their shape longer, and keep this powerful diesel powerful.*

Ni-Resist iron effectively resists wear, corrosion at diesel operating temperatures. Ni-Resist inserts remain tight in piston service.

Ni-Resist ring carrier inserts, cylinder liners, valve guides, and exhaust manifolds can reduce your maintenance problems. Fill out the coupon on the right if you want to know how Ni-Resist can extend the life of your diesel equipment.

*Registered trademark

The INTERNATIONAL NICKEL COMPANY, Inc.
67 Wall Street New York 5, N. Y.

INCO TRADE MARK

The International Nickel Co., Inc.
67 Wall Street, New York 5, N. Y.

Gentlemen:

Please send me "Keep 'Em Rolling" and "Engineering Properties and Applications of Ni-Resist."

Name _____

Title _____

Company _____

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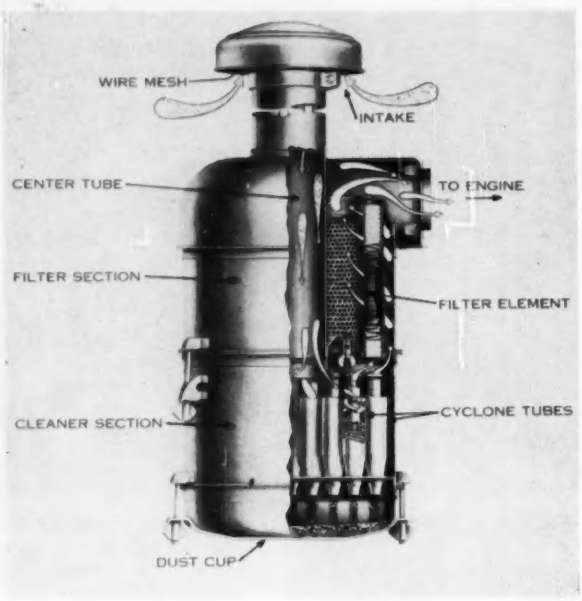
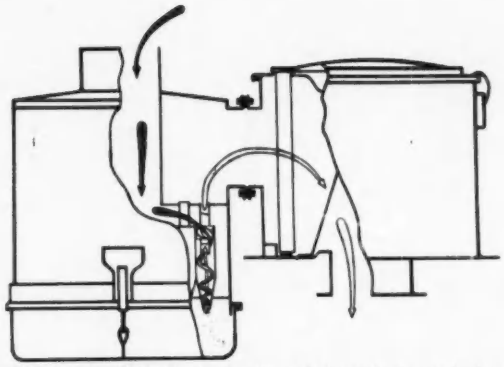
D.P.-2-59.





Installation flexibility of the Donaldson 2-stage air-cleaner is shown by three different designs. The SDA, at left, has the center tube inlet and side outlet typical of many oil-washed air cleaners. Its tube section is removable and the filter element is serviced from the bottom. Above design shows how tube section and filter section can be separated into individual units and then connected by ductwork.

Two-Stage Air Cleaning Boosts Filter's Service Life

Efficient cyclonic precleaners team up with paper filter for high cleaning efficiency with reduced servicing.

NEW ideas in dry-type air filtration are overcoming some earlier difficulties encountered. Paper filters could boast of very high efficiencies but this very fact posed a problem. Dirt buildup improved the efficiency but soon increased flow restriction to unacceptable levels. This meant frequent servicing. Here is one idea on how to retain high efficiency and yet obtain good service life.

Donaldson's new Donaclone SDG air cleaner uses a dual dry system. It combines a centrifugal cleaning stage, (Donaclone tubes) with a specially-engineered paper (Duralife) filter. The primary centrifugal stage removes up to 98% of dust from the air. Remaining dust is removed by paper filtration.

Operation

This 2-stage system gives the efficiency of paper filtration plus the long service life of other type air cleaners.

In operation, dirty air is drawn through a conventional inlet into a chamber which is a common entrance to cyclonic tubes. Air enters these tubes and is rotated by helical vanes at the top of the tubes. This action exerts centrifugal force on the air.

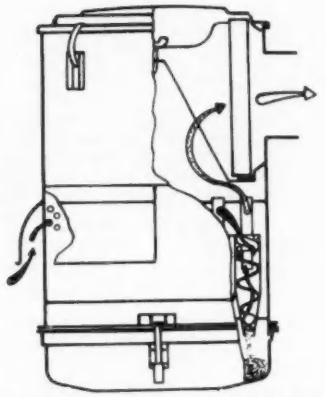
Air spirals down the coned section of the tube and reverses direction at the bottom. As air reverses within the cyclonic tube, dust is ejected to a dust cup at the bottom. Cleaned air then moves through the cyclonic tube outlet and to the paper filter element for final filtration before entering the engine.

The heart of the air cleaner is the specially-designed cyclonic tube. To do the required job, high efficiency is required. Efficiency range of common types of precleaners is 70 to 80%. By careful design and accuracy of manufacture the efficiency of these tubes is 96 to 98%. Thus, the dirt load of the paper filter is tremendously reduced.

The paper filter is protected by a perforated steel shell. The chemically-treated paper is cured to combine structural rigidity with resistance to oil and water. Embossing and pleating provide a large usable surface area. Paper porosity is closely controlled so that dust particles in the extremely low micron range can be removed.

Over 10,000 operating hours have been accumulated on individual test air cleaners. Test vehicles included farm tractors, over-highway trucks, off-highway construction equipment, rock-crushers and military tanks. Installations have been made on engines from 35 to 800 hp. Tests were performed under all types of weather and temperature conditions.

Visual inspection in these field tests supported efficiency improvements shown by laboratory tests. Air transfer pipes following the air cleaners were found clean and dry. A substantial reduction in upper engine wear is thus indicated.



Another design, the SDG, has a side inlet which can be shrouded or tubular and a side outlet. The filter element is serviced from the top.

TYPE OF EQUIPMENT	HOURS OF OPERATION* MINIMUM	MAXIMUM	AVERAGE
Crawler Tractors	108	1505	492
Scrapers	355	899	557
Trucks (off-highway)	753	2115	1144
Front End Loaders	974	1473	1224
Rock Crushers and Ashpalt Plants	34	489	213

*Based on actual field data on new elements to 30" H_2O

Servicing Filter

Service periods of the dust collection cup depend on dust concentrations in the air. Service intervals vary from eight hours to six months.

Servicing is simple—just remove the dust cup, empty it and replace it. This cup should be inspected daily until experience indicates frequency of service. Service intervals may range from 4 to 120 hours but dust level in the cup should never be allowed to build up to the bottom of the tubes.

Field results show that special and regular servicing is not necessary on the tubes. Internal brushing will generally remove unusual deposits.

Service Life Of Filter Elements

Service life on paper elements ranged to over 2000 hours depending on the type of application and operating conditions. For example, 21 new filter elements in Donaclones installed on off-highway trucks on the Mesabi Iron Range varied in service life from 753 to 2115 hours—with an average of 1144 hours.

Service life on paper filters operating under severe dust conditions such as rockcrusher installations ranged from 34 to 489 hours with an average of 213 hours. See Table.

Although a paper filter is generally considered an expendable cartridge, proper and careful cleaning can extend its original life. In these field tests, elements were serviced up to five times without damage. As high as 100% additional operating life was found after an element cleaning. This added life depends on a number of factors including dust particle size, type and concentration.

Several methods have been used to clean paper elements. However, they must be handled with care. Rough handling and use of sharp scrapers, etc., has often resulted in holes that completely destroy the element's effectiveness. A jet of compressed air in the direction opposite to the normal air flow has been found to be most successful.

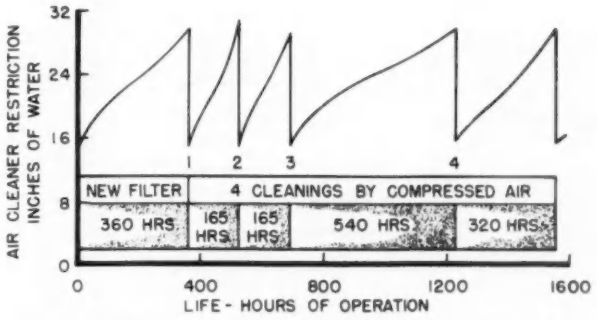
The need for service can be measured accurately. Dirt makes the paper filter more efficient but increases its resistance to air flow. Thus, some indicator is needed to tell when the filter should be cleaned. Several pressure-differential indicators are available for this purpose. Servicing the filter cartridge is recommended when air restriction has increased to 20-in. of water at high idle.

Operational Economies

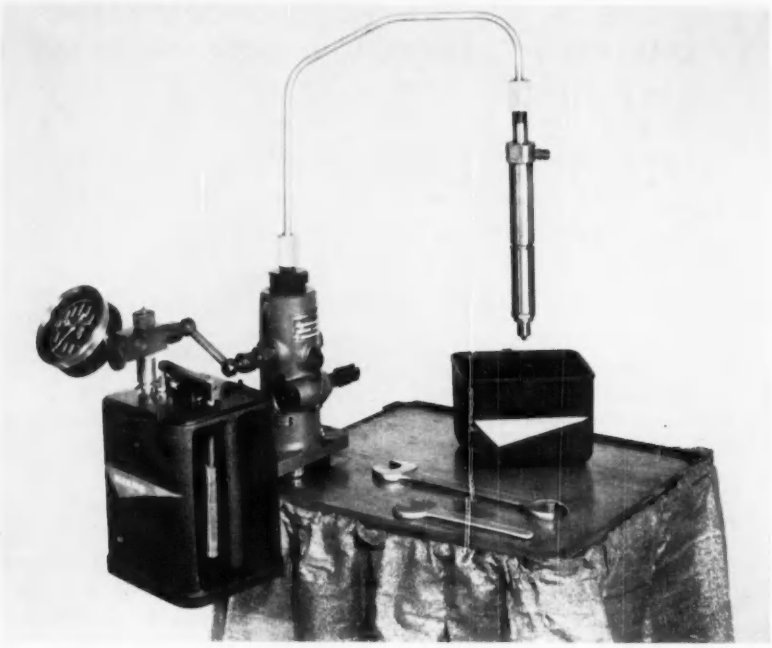
Effective precleaning through use of a 2-stage air cleaner plus ability to clean the paper filter results in substantial savings. For example, at least one leading construction equipment manufacturer has found savings in filter servicing costs. In a field test involving 47 Donaclone air cleaners he found a reduction of over 45% in service costs. Another company, a large mining outfit operating a fleet of 150 off-highway trucks found a 66% reduction in service costs.

Effectiveness of filtration will also result in lowered engine maintenance costs. The correlation between air cleaning efficiency and upper-engine wear has been well established.

The long service life of 2-stage units is combined with a high and level efficiency over the entire air flow range. This is important from the standpoint of engine protection because varying air flow and reduction of engine speed settings occur in normal field use.



DONACLONE FILTER ELEMENT SERVICE LIFE
(CRAWLER TRACTOR OPERATION IN SOUTHWEST UNITED STATES)



Typical connection of portable tester for testing fuel pump and nozzle right on the engine. By testing on engine without removing pumps and nozzles, much time is saved and troubles avoided.

Injection Inspection — The Easy Way

Portable test kit worked into railroad injection equipment inspection programs makes tests right on the engine. Results—significant time saving, fewer troubles.

PERIODIC inspection of locomotives include a check on fuel injection equipment. If nozzles on say a 12- or 16-cyl engine have to be removed for bench testing and than reinstalled, as much as 8 work hours is involved. Even then you don't have the full story. Many engines have been buttoned up and started, only to find that the job has to be done again.

One trouble with injection equipment—and many fuel injection shops know this for sure—is that many things can happen between the final bench test of injection equipment and starting of the engine. Dirt can be introduced into the equipment. Nozzles or injectors can be improperly installed. Carbon deposits can be left in injection holes, seats can be faulty, gaskets improperly installed or bad ones reused, and uneven or overtorque of hold-down devices can result in improper operation. When the trouble has to be fixed, the question is, "Which one?"

These are the circumstances that led Illinois Auto-Electric Co., that has a department specializing in railroad fuel injection service both in the shop and in the field, to find a way to check injection equipment, right on the engine. Such a tool—worked into the railroad's inspection and maintenance program—would cut inspection time and also eliminate all possibility of trouble being introduced by unnecessary removal of injection equipment.

Kiene's portable nozzle tester was used as the basis for the test tool and the necessary hardware and procedures were worked out in a three-way project of Illinois Auto Electric, railroads service shops and Kiene. The test kit is now available through Illinois Auto Electric and is in use in several railroad shops.

This tester is just that—a test tool to give indication if trouble exists and tell where. With some experience and good judgement, it is a valuable adjunct to an inspection

Portable injection equipment tester with complete kit of adaptors for testing right on the engine injection pumps and nozzles of Alco, Baldwin, B-L-H, Fairbanks-Morse, EMD and Series 110 GM railroad diesels.

program—a real time saver. Average figures show time savings up to 80% in performing inspections and clearing troubles.

The principle of operation of the tester is to approximate injection pump operation so that the pump can be tested for leakage and the nozzle tested for condition right on the engine. To perform basic tests the tester can be directly connected to the pump inlet. With the fuel rack in the "off" position, fuel pressure can then be built up in the pump, through the delivery valve, high-pressure line and nozzle.

Pressure also registers on the tester gauge. With experience, this pressure reading, including needle fluctuations, can tell a lot about pump and nozzle condition.

Presence of such defects as incorrect popping pressure, leaking seats, excessive needle clearance and sluggish or stuck needles are easily found.

For example, on nozzles of the popping or inward-opening type used on some locomotive engines, opening action is readily indicated on the tester gauge by a quick drop in pressure. Maximum pressure registering on the gauge before it begins to fall is the popping pressure. If this is outside the acceptable range specified by the engine builder it has to be corrected.

Pressure pattern and gauge needle fluctuations can tell much about pump and nozzle condition. These observations are compared with what has been found by experience to be normal for the specific type units being tested. Variations from this "norm" give indications of troubles.

Conditions such as leaking nozzle seats and excessive clearance between needle and nozzle body or between pump plunger and barrel are readily found. When pressure is built up to within say 50 psi of the specified popping pressure, the gauge needle should fall slowly, indicating a normal rate of pressure drop as based on previous experience. If pressure drops at an excessive rate it means that there is leakage.

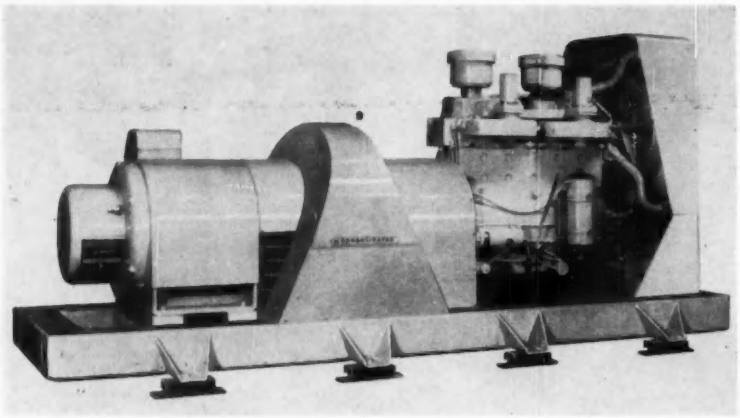
To locate the leakage, the tester can be connected to the nozzle alone through use of appropriate adaptors. Thus, if excessive rate of pressure drop is eliminated when the tester is directly connected to the nozzle, the leakage must be in the pump.

If with the tester connected directly to the nozzle the rate of pressure drop is still excessive, check for leakage at the leak-off line at the nozzle. If that is normal, leakage is at the nozzle seat or one or more of the lapped surfaces.

In unit injectors such as those used in EMD locomotive engines, the same troubles can be diagnosed except that the procedure is slightly different. For example, to check opening pressure and pump plunger and barrel leakage, the injector fuel return line must first be blocked off or no pressure can be built up with the tester.

Opening pressure can then be checked as described above. Leak-off past plunger and barrel is checked by building up pressure to that slightly below the specified opening pressure and rate of pressure drop is compared to a "norm" established by experience.

This test kit should be a welcome addition to the instrumentation of any railroad repair shop. With experience, the kit can do a lot more than the simple basic tests indicated. Many railroad shops have already proved this. The savings in time and money obtained through its use has payed for the test kit in a very short time.



Con-Diesel's Model UPS standby generator set for uninterrupted power. The 100-kw Electric Machinery Co. generator is driven through a clutch by a Continental SD802 diesel rated 202 hp at 1800 rpm. This 5 9/16-in. by 5 1/2-in. bore and stroke, 4-cycle, 6-cyl diesel uses an American Bosch injection system and Young Radiator Co. radiator.

Designing For Uninterrupted Power

By M. J. Sullivan — Power Equipment Division, Consolidated Diesel Electric Corp.

Demands for no-break power for vital military and industrial applications are increasing. Here are the factors involved in designing such units and how one company has overcome the problem.

VITAL applications cannot tolerate electrical power loss for any period of time, no matter how slight. Diesel generator sets supply either primary power or back up other power sources. The missile and rocket age is making power requirements more vital and opening new uses for such sets. Applications include missile tracking stations, automatic ground-controlled approach systems, electronic switching centers, and control power for nuclear reactors.

During the 16 years Con Diesel has been making generator sets, the time interval required for emergency units to come on the line has been gradually reduced. Initially, application requirements indicated that 80 seconds was an acceptable transfer time. This was subsequently lowered to 60, then to 25 and still later to 12 seconds.

Today's high-speed aircraft, missiles, anti-missiles, long range radar, aircraft ground approach systems, etc., demand standby units that can take over a load instantaneously—and without power supply interruption. Three years ago, our Engineering Dept. initiated a research and development program to obtain an uninterrupted power supply.

What Are The Requirements?

A survey of applications was made and engineering goals were established. Here's a list of these goals and the reasons for setting them.

1. Sizes up to 100 kw to meet future customer requirements.

2. No voltage loss below 70% of normal during any transition for any period of time since most standard electrical equipment can tolerate a momentary drop in voltage to this point.

3. Frequency not to fall below 58 cycles (for the 60 cycle condition) for any period of time, with a gradual restoration to normal since on the whole, electronic equipment could stand a drop of two cycles, also, a slow restoration to the normal produced less distortion in electronic equipment than a quick but fluctuating restoration of frequency.

4. A unit similar in configuration to present generator sets to permit customer acceptance.

5. A unit of minimum size to reduce building space required.

6. A unit that would not require storage batteries in operation since customer surveys indicated greatest reason of failure to start was batteries not being maintained.

7. Unmanned operation on and off the line to eliminate human failure and to allow compatibility with automated equipment.

8. Precise regulation in voltage and frequency when on the line since equipment would be used to supply power to loads that required almost constant frequency and voltage to give proper outputs (for example, computors).

Designing To Meet Requirements

The configuration first proposed was an alternator-motor-diesel engine combination, all in line. Our

preliminary plan was to relieve compression on the engine and have it constantly rotating so that if commercial power failed, the load could be immediately shifted by transferring the compression release from "off" to "on."

After study, it was found that certain parts of the diesel engine would wear excessively. This made it unsatisfactory since it would result in higher maintenance costs, with possible failure of fan belts, lube oil filters and other parts that would be in continuous service even though the engine was not producing any power.

It was decided therefore, to use a clutch between the rotating equipment and the diesel. With this arrangement there would be no wear on any part of the engine since it would be at a standstill until required to deliver load.

In reviewing the type of clutch required, consideration was given a number of different designs—hydraulic, mechanical, pneumatic, and magnetic. During actual clutch tests, careful measurements were made of the time interval required to bring the diesel up to operating speed, crankshaft stresses, time required to inject fuel, time lapse before engine assumed full power, clutch wear due to slippage and many other measurements that could not be otherwise calculated.

It was found the engine normally began fuel injection 1/25 of a second after rotation commenced and full power was delivered in about one second.

Tests indicated that inertia required to carry transient loads were not enormous and that satisfactory cranking arrangements could be obtained using either hydraulic, mechanical, pneumatic or magnetic clutches. Failure was encountered with certain friction clutch facings after about 500 engagements. This resulted in design of a new and more durable friction clutch.

Since electrical power was available and the clutch could be easily controlled, we decided to adopt the magnetic clutch arrangement.

What Generator Arrangement?

The next problem was that of the rotating equipment. Most of the "no break" power installations use an engine-clutch-electric motor-generator combination, all in line. The generator is driven either by the motor or the engine depending on the condition of prime power.

Since one of our design concepts involved a power source supplying up to 100 kw, this arrangement was costly and size of the unit became prohibitive. Furthermore, our Sales Dept. felt customer acceptance would be lacking for this arrangement. The project engineer therefore recommended that the synchronous alternator should be "motored" on the line and that the inertia needed to maintain power during the time required to bring the engine up to speed should be provided by a flywheel. Careful study of this recommendation indicated the approach was a good one and that both the size and cost of the set would be greatly reduced.

The necessary equipment to build an engineering prototype was purchased and a unit built in our Experimental Shop to check the calculated effects on voltage, response time and frequency during operation and power transition.

Extensive tests were made using electric generators, exciters and voltage regulator combinations to produce optimum results. Voltage oscillograph pictures were made of the performance of these combinations. Following completion of the test program, results were compared to determine which combination proved best in terms of known customer requirements.

The best results were obtained from an alternator using static excitation and static voltage regulation. Satisfactory results also were obtained using a mechanical type regulator with a rotating exciter. But here the time interval for voltage restoration was in excess of that acceptable to most customers. We consequently adopted the static excitation and voltage regulator since this combination not only produces best results but has no moving parts thus requiring little or no maintenance.

The dream of an uninterrupted power supply began to emerge as reality since we had now carefully designed, checked, tested and combined proven components into a workable unit.

Controls Are The "Brain"

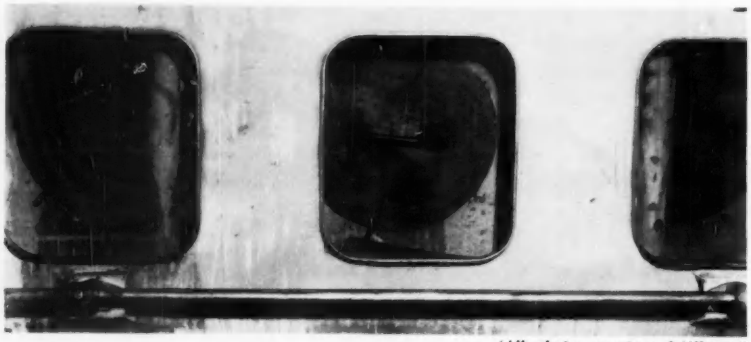
The most difficult part of any automatic power supply is the switching arrangement by which the unit is connected to and disconnected from commercial power. To energize the automatic equipment and start the engine, both voltage-sensitive relays and a reverse-power relay were used. Tests were conducted including oscillographs of the sine wave of commercial power and standby power during transition. Results showed the sine wave was practically undisturbed.

Having hurdled the last real barrier to the uninterrupted power supply, our Engineering Dept. proceeded to design the automatic controls required to actuate the equipment, put it on the line, resynchronize with commercial power, and shut down the engine. It was found that when commercial power was restored, diesel speed could be automatically varied to resynchronize with it.

Results

After the electrical circuitry was completed and components tested, the unit was set in Test Bay and recycled on and off the line to determine its ability to start without failure. A cycle consisted of failing commercial power with load on alternator, successfully starting diesel and assuming load, continued carrying of load, reapplication of commercial power, synchronizing with commercial power, and engine shut down. After the unit had been cycled 1500 times without failing even once, it was felt that satisfactory performance had been achieved.

Three years of research and development had finally culminated in the ultimate standby power supply—uninterrupted power with full voltage restoration to the load in less than two milliseconds.



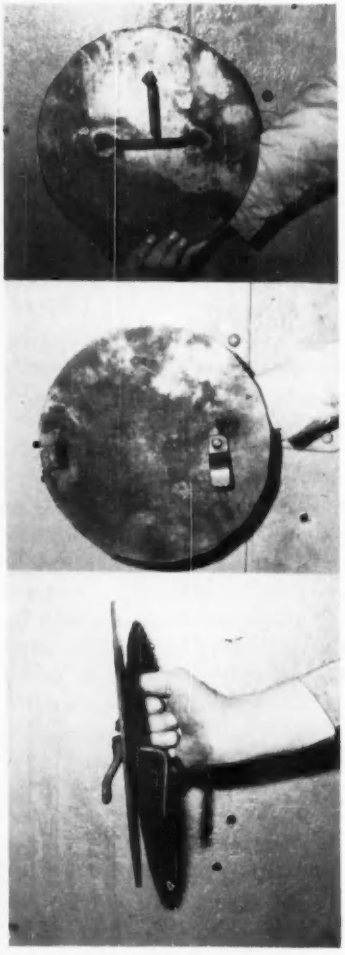
Protective covers are seen snapped in place sealing the air box area from the liners of an EMD locomotive diesel. These protective covers are made from No. 8 black iron.

(All photos courtesy J-Milepost)

Cleaning Of Locomotive Engine Air Boxes Simplified

Masking covers make a normally messy and tedious job easier. Solvent sprays do most of the work.

Front (top), back (center) and side (bottom) views of the air box-to-liner blanking covers. Side view shows how spring clip can be easily manipulated.



CLEANING air boxes of 2-cycle locomotive diesels must be a real problem. A "Highlight" on this subject appearing in the October 1958 issue of DIESEL POWER brought in many requests for additional information. This item referred to a new, simple method for cleaning air boxes in locomotive diesels.

A letter to the Elgin, Joliet and Eastern Railway Company's Mechanical Department in Joliet, Ill. requested details on the new method. A letter from Mr. C. G. Mahoney, Superintendent Motive Power for this railroad gave these details and compared the new cleaning method to the old.

For years, air boxes on this railroad's locomotive diesels were cleaned by hand. A solvent was used to loosen the carbon and abrasives in the air box, then a man wiped this mess out manually. Great care had to be taken so that the strong solvent did not get on the engine's pistons, rings and liners and the service man's hands. When the job was finished, the air box had to be completely dry.

This method was slow and time consuming. The solvent could not be sprayed on for fear that its vapors or loosened abrasives would go through the scavenging ports of the cylinder liners and deposit on the liner walls.

Since spraying with solvent is the easiest and best way to loosen the foreign matter in the air boxes, a method was devised to permit its safe use. A protective cover with a small spring snap retaining feature was developed. This snapped into place to cover each circular opening on the plate in front of the liner.

This cover seals off the air box area from the liner and permits the air box to be thoroughly saturated with solvent. Mr. Mahoney uses "stanasol" made by the Standard Oil Company of Indiana.

The abrasive residue then runs off and there is no need to wipe the air box by hand, thus eliminating solvent contact with the employees hands and arms. Plus this, about an hour is saved per locomotive over the old method.

Sufficient covers should be made to completely cover all open areas on each side of the engine block. The covers should cover to about one-half inch on each side of the circular openings.

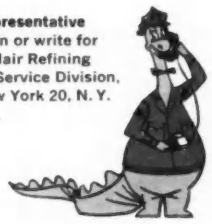
The snap retaining feature can be made from small pieces of spring steel. These are arranged in the same way as the clips found on old home-type chimney flue covers.

Bearings...

Oil... and How to Save Money

The longer your Diesel runs before need of overhaul—the less your cost of operation. Sinclair Gascon® Oils have earned the reputation not only for giving long bearing life, but also for resisting the formation of harmful carbon deposits. Gascon Oils slash down-time and maintenance costs. Next time management asks how you've cut costs, tell them you've switched to Sinclair Gascon—and show them the results.

Call your Sinclair Representative for further information or write for free literature to Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.



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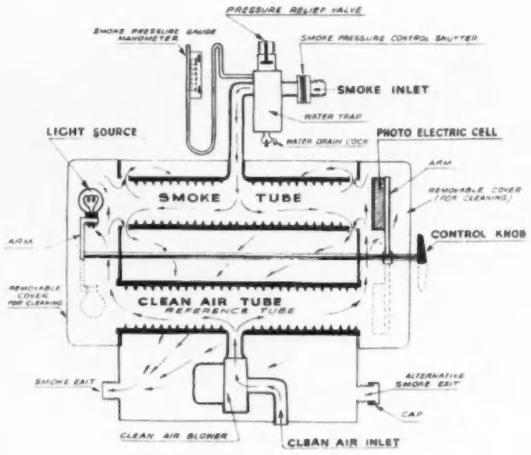


Hartridge smokemeter is seen above with schematic view at right.

Monitoring Smoke Intensity

Engine smoke indicates inefficiency and is a public nuisance. Capability of accurate smoke measurement on the test bench and in the field makes smoke meters valuable test tools to avoid these problems.

EXHAUST smoke has two undesirable affects. First, it adversly affects engine performance, economy and maintenance. Second, it is becoming a particularly difficult public relations problem.

Now, how do you measure smoke? At what intensity is it a problem or objectionable? Commonly, visual comparison with sample charts is used and allowable intensities are often arbitrary. Actually, there is too much margin for error and little standardization.

From the operational point of view, an accurate check on exhaust smoke can do two things: (a) provide a means for setting maximum fuel and (b) serve as a test tool to determine existance of conditions leading to smoking—excessive intake air restriction, faulty fuel injection equipment, etc.

Smoke levels are a means used by many technicians for setting maximum fuel. Visual check for these smoke levels may not be accurate due to various reasons. Thus, maximum fuel settings in accordance with visual smoke checks may lead to overfueling resulting in high maintenance costs and poor fuel economy. One of various smokemeters available would eliminate any guesswork and errors involved.

Further, a smokemeter that can be used on the engine in the field as well as in the shop gives other advantages. A truck engine, for example, can be checked more accurately for smoke over its entire route, and adjustments made to avoid smoking on hills, etc. Conditions resulting in smoke on the road which are difficult to find in the shop can also be eliminated.

A new smokemeter that offers this possibility is the portable unit made by Leslie Hartridge, Ltd., London, and distributed in this country by Diesel Injection Sales & Service, Inc., Norfolk, Va.

Plus helping to maintain high engine performance and economy, use of a portable smokemeter goes a long way toward eliminating the vehicle diesel's part in air pollution. This is an acute problem in many localities. Some states already have legislation which outlaws smoking vehicles and imposes fines on those that do. Other states will soon follow suit.

One feature of Hartridge smokemeters is that standardized comparisons are possible among all these instruments. Each one is adjusted to show a constant reading on a density scale in accordance with a standard grey filter supplied with each unit.

Hartridge Smokemeter

Hartridge's smokemeter gives an instantaneous direct reading of smoke density on a scale. Its operation is based on comparison of the density of a column of smoke with a column of clean air.

The accompanying diagram shows the instrument's smoke tube and clean air tube which are identical. At one end of the tubes there is a 12-v, 36-w light, at the other end, a photoelectric cell. These are mounted on swinging arms that can be moved from the smoke tube to the clean air tube by a control lever.

The photocell is connected to a micro-ammeter with a smoke density scale reading of 0—100, representing percentage of light ab-

sorbed. A small blower draws in air to the clean air tube which then passes across the surfaces of the light, reflector and photocell. This air flow prevents sooting of these surfaces which if contaminated would give inaccurate readings.

To make a test a sampling tube is connected to an engine exhaust pipe. The smokemeter is switched on and the control lever set to the air tube. The smoke density scale is set to zero by means of a potentiometer indicating "no smoke". When the control lever is moved to the smoke tube an immediate reading of smoke density is recorded on the scale.

Special Features

The instruments have some special features. For example, the smoke tube can be dismantled in seconds for occasional cleaning with a special brush.

To reduce the quantity of condensation moisture in the sampling tube, a water trap is supplied. This is particularly useful in road testing when a long sampling pipe is necessary to connect the smokemeter with the exhaust outlet. A cut-off valve is also in the line.

To insure that the exhaust smoke sample pressure does not exceed the blower pressure, a relief valve is fitted on the water trap. A pressure meter which can be attached to the back of the smokemeter is also available. This is particularly useful in engine test stand work.

One model is for battery operation only and incorporates a 12-v battery charger. A second unit is powered by plugging into alternating current up to 250-v but also has a compartment for a heavy-duty 12-v battery.

Conclusion

The ability of this instrument to measure exhaust smoke density quickly and accurately both in shops and on the road makes it a practical and desirable unit. It is a valuable service and test tool for helping to maintain good engine performance and economy and reduce air pollution.

Concrete Placement — Another Job For Tractor Shovels

AN Allis-Chalmers tractor shovel has solved a contractor's concrete pouring problem. W. A. Sheets & Sons, Inc., of Fort Wayne, Ind., was ready to pour the foundation footings for a new school building in Fort Wayne. However, continuous heavy rains had turned the 400-ft access to the construction site into a sea of mud. Concrete mix trucks were unable to get through the soup.

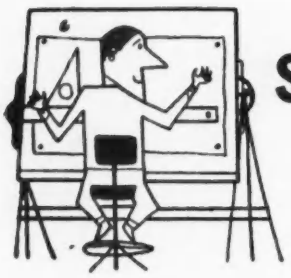
This apparently hopeless situation triggered the firm's engineers to thinking and they came up with a unique answer.

In their shop, a concrete bucket shell was fabricated to fit into the standard bucket provided with A-C's HD-6G tractor shovel. Lightweight sheet metal was used for the back and sides of the shell. The front, or pouring side, was constructed of ¼-in. sheet steel. A 12 x 12-in. discharge chute was fitted with a hand-operated hopper gate. Then the entire assembly was secured in the tractor's standard bucket by four bolts.

The tractor shovel and its new accessory were then put to work. It delivered and poured 17 cu yd of concrete in less than three hours. The special bucket was fed by concrete mix trucks positioned on a gravel base adjacent the street. The HD-6G easily ran over the mud approach to the job site. Spotting was quick and pouring control was excellent. Complete discharge of the material was effected by tipping the bucket gently forward.

When the concrete bucket liner is not needed, it is easily removed by taking out the four bolts. Efficiency of the standard bucket for normal earthmoving is not affected.

The rig was a complete success. It is so successful, in fact, that it has been used on numerous other jobs. One of the more recent jobs where the bucket insert was used was on a warehouse construction project in Wabash, Ind. Here it poured 7-ft high columns.



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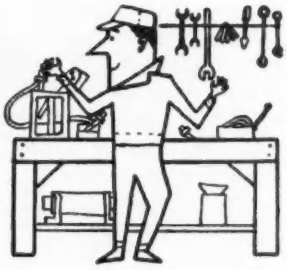
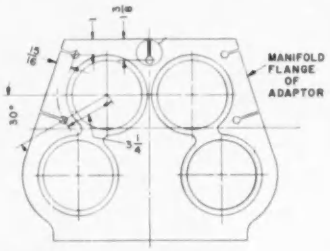


Recent engine and equipment modifications, procedures and recommendations straight from the different manufacturers to you



Alco Exhaust Manifold Modification

To lengthen exhaust manifold life Alco Products, Inc. has modified the manifold to prevent occasional cracking occurring in the 16-cyl, model 244 and 251 engine manifold adapters.

The modification involves use of four 7/16-in. holes in the adapter turbo flange and drilling five 7/16-in. holes in the adapter manifold flange. These holes are then connected to the outer edges with 1/16-in. saw cuts (see sketch). A shield is then bolted to the manifold adapter flange to prevent escape of gases through the cuts.

This modification has been successfully field tested and is standard on production manifolds.

How to Extend Battery Life

A service tip from F. P. Plovick, Field Service Mgr., Delco Remy Div. of G.M. tells us that accumulated grime and corrosion on battery tops and terminal clamps may cause excessive self-discharge especially while vehicle is not running.

He suggests cleaning tops and terminal clamps with a heaping teaspoon of baking soda dissolved in a quart of water. This will extend effective service life. Soda solution should be brushed on until all foaming stops, then rinsed off with clear water. Light coating of petroleum jelly on the terminal clamps completes the job. Make sure no soda solution gets inside battery.

Protect Oil Seals

Whenever a lip-type oil seal is installed in a power take-off reduction gear assembly, don't damage the edge of the oil seal.

One method recommended by G.M. to protect the seal is to wrap a thin piece of shim stock around the power take-off shaft. Then place a strip of scotch tape along entire length of overlap. Drive shaft bearing and seal retainer can be lowered over the shaft without damage to seal.

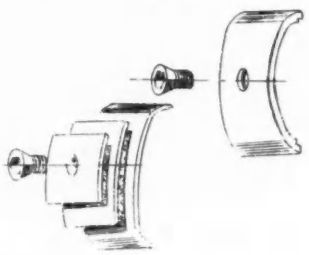
This method can be used also to protect oil seals in Paragon marine gear assemblies and any other transmission assembly using lip-type seal.

IH's Full Flow Cooling System

The cooling system on International Harvester's TD-24 (241 Series) crawler tractors, UD-525, U-1091 and UD-1091 Power Units has been changed from a partial-flow by-pass system to a full-flow by-pass system. New design offers increased and more uniform water circulation.

New full-flow cooling system incorporates only two thermostats instead of four in TD-24 crawler tractor, U-1091 and UD-1091 power units and one thermostat instead of two in UD-525 power unit. They are much larger and eliminate additional thermostat restrictions in cooling system. This permits greater volume of coolant to circulate for uniform cooling whether thermostats are closed on by-pass or open for complete water circulation.

A comparison to the old type system on U-1091 and UD-1091 that used four thermostats shows an increase in the water flow of 56 gpm when thermostat is in by-pass (warm-up) position and an increase of 34 gpm when in main-flow position (all the water through the radiator).



Roosa-Master Single-Spring Maximum Fuel Adjustment

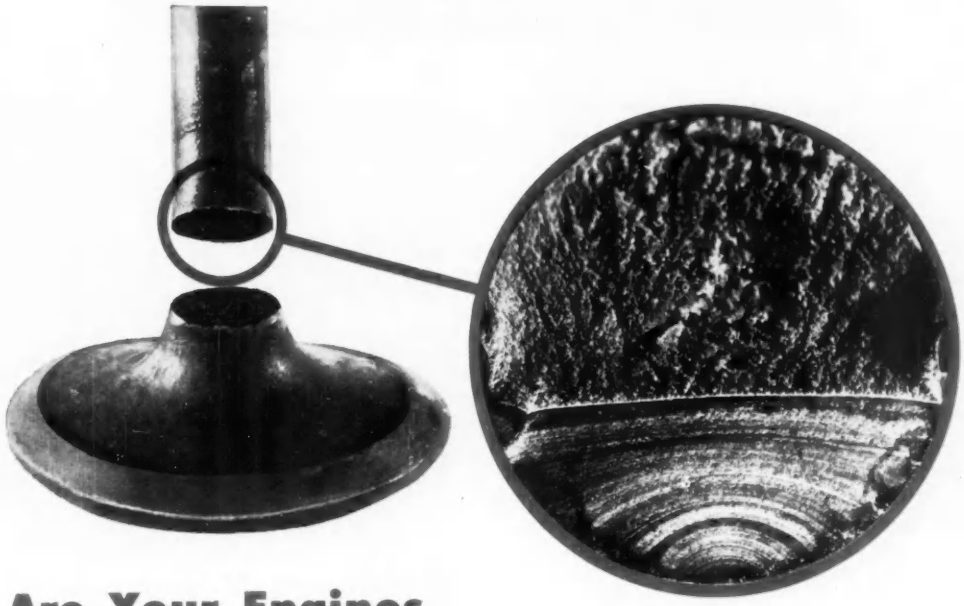
The three nesting leaf springs used in Roosa-Master pumps are being replaced by one main leaf spring. Springs with following part numbers are obsolete: 213, 213-1, 213-2, 213-6, 213-6-1, 213-6-2.

Replace any combination of three old springs with port number 213-7-1, if roller setting is less than 1.970-in. or 213-7-3, if roller setting is more than 1.969-in. The new single leaf spring is being supplied in all production pumps starting with Serial No. 55000.

Torquing Cat Cylinder Heads

Cylinder head retaining nut torque values have been increased on Caterpiller D7 and D8 tractors, No. 572 and No. 583 pipelayers and D339 and D342 engines. The higher torque values minimize possibility of retaining nuts loosening during operation and provide better cylinder head gasket sealing.

The 5/8-in. stud nuts are now tightened to 105 lb ft and the 7/8-in. stud nuts are now tightened to 250 lb ft. To permit tightening to these higher torque values, thicker and hardened washers are used beneath hardened nuts. The hardened nuts and washers are adaptable to earlier applications of the D339 and D342 engines to permit increasing retaining nut torque.



Are Your Engines Plagued by Failures Like This?

Eaton Engineers Can Help You Solve This Problem

The photographs above illustrate a typical fatigue-type failure caused by overstressing, in which fracture starts at the surface and, with repeated high stress, progresses to final break.

If you are an engine manufacturer and are having valve gear problems, Eaton engineers will be glad to consult with you and recommend procedures to help solve them. Or if you are designing new engines, perhaps our past valve experience can be valuable to you. Write, wire, or phone — there's no obligation.

Eaton Technical Reports are Available to Manufacturers

Eaton valve engineers will be glad to make a thorough study for you and furnish a complete technical report.

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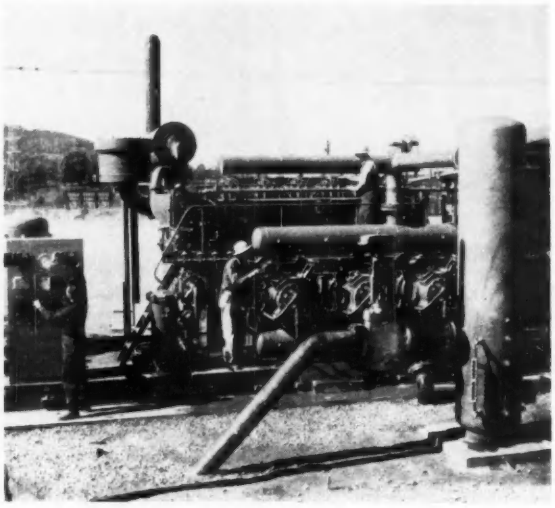
industry news

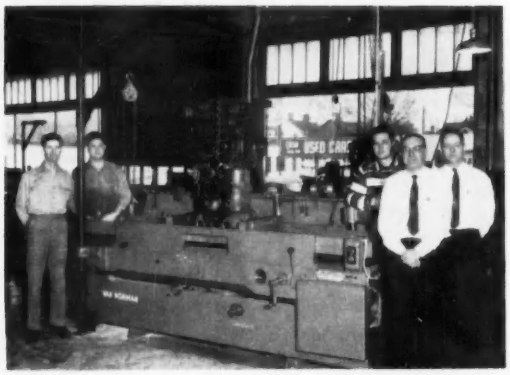
Worthington Gas Engine Compressor Installed

Late in the fall of 1958 the Atlanta Gas Light Co. put on the line just north of Marietta, Ga., this skid-mounted, Worthington 575-hp SLHC-6 angle gas engine compressor package engineered by the A. M. Lockett Co., New Orleans. It handles natural gas at a suction pressure of 70 psig and delivers at 190 to 275 psig, depending on demand.

Because of this great variation in discharge pressure and capacity, four of its six compressor ends have diaphram-type suction valve unloaders. Center cylinder is loaded at all times. Once desired pressure is determined, the unit automatically loads or unloads one or more compressor ends to give correct capacity.

The engine also automatically varies between half and full speed within each unloading step, thus giving an infinite number of capacity steps at any discharge pressure between 190 and 275 psig.





Automatic Grinder Provides Versatility

Here's an example of how flexible shop tooling can mean additional income. In this case it's a Van Norman "above-the-wheel" automatic wet surface grinder that provides the versatility. Service Auto Parts, Inc., Knoxville, Tenn., is using it for grinding the top of the block of a compressor without removing crankshaft and pistons, thus avoiding complete disassembly.

Compressor height made it impossible to do the job on an average grinder. Compressor owners wanted to avoid disassembly since removal of corrosion on block was the major reason for reconditioning it. Disassembly meant extra downtime and expense since several units were involved.

First Production Order For New GM V's

J. Rosenblatt (right), Eimco Corp. president, is seen placing the first production order for the 6V-71 diesel engines, announced recently by GM Diesel (See Diesel Power, January 1959 issue). The Eimco Corp., Salt Lake City, U., a mining and construction equipment builder, will use the new engine in the 2¾-yd Eimco 105 front end loader.

Receiving the order for 100 engines is R. E. Hunter (center), general sales manager of Detroit Diesel. C. W. Truxell (left), GM Diesel's general manager witnesses transaction.

Rated 205 hp at 2000 rpm, the 6V-71 offers identical design features of the Series 71's plus more power, higher torque, greater acceleration and improved performance. Yet it fits the space occupied by a 4-cyl inline engine.

new products . Page 40

people and plants . . Page 44

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Canada-Built Equipment for Canadian National

Canadian National Railways took delivery recently of the first GMD-1, a newly-designed branch-line diesel-electric locomotive. This unit was completely designed and engineered by GM Diesel Ltd. London, Ont.

The new versatile locomotive was developed to meet the low axle load requirements of branch line operation under Canadian conditions. Also, to provide a locomotive for road switching and passenger service when equipped with a steam generator.

The 1200-hp GMD-1 features light axle loading, high speed, rugged construction, excellent visibility, and steam generators.

Another GM Diesel Ltd. unit for Canada's railways, a mobile steam generator, rolled off the assembly line recently.

It is to be used primarily for branchline passenger service, coupled to locomotives which are not equipped with steam generators. However, the versatile unit can be used for shop, terminal train, and work train heating. It can also be used for standby protection mainline passenger service trains.

Oakite's 50 Years In Industrial Cleaning

Continuing research and in-plant service are essential to progress in industrial cleaning, according to Oakite Products, Inc., which celebrates its 50th Anniversary this month. It was research, in fact, that gave David G. Ball the idea that led to the founding, of the Oakley Chemical Co. (Now Oakite) in February 1909.

Today, Oakite's family of cleaning compounds and chemical specialties numbers about 150.

Oakite's laboratories occupy 30,000 sq ft manned by experienced chemists and technicians. Working in teams they develop about 12 new products a year.

The company's attention to research has been closely related to development of its field service staff. Cleaning in the laboratory is not the same as cleaning in actual production.

This 250-man field service staff, is charged with a dual responsibility; selling and servicing so the customer gets most efficient operation at lowest price; and alerting their laboratories to new industrial needs in the field of surface treatment.

Union Pacific's Safety Record

A record of over 10-million passenger miles without a passenger fatality has been set by Union Pacific Railroad. At the latest count, taken Nov. 30, 1958, the railroad had chalked up 10,018,366,980 passenger miles since the last mishap.

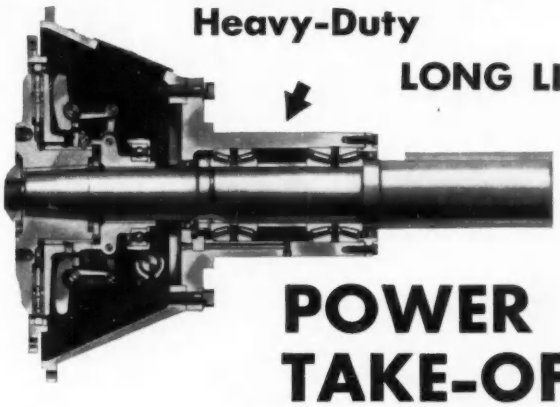
According to A. E. Stoddard, U.P. President, this achievement must be shared by all employees, particularly those in the operating, maintenance of way and mechanical departments. He said that a great deal of their passenger business can be attributed to the fact that passengers are assured they will have a safe and happy trip.

ROCKFORD

OIL FIELD TYPE

Heavy-Duty

LONG LIFE



POWER TAKE-OFF

➡ Bearings Need Lubrication Only Once a Year

The special, large Timken main bearings in the new ROCKFORD POWER TAKE-OFF are adjusted when assembled at the factory. They require no further adjustment—and run in a reservoir of lubricating oil that needs replenishment not oftener than once a year. The clutch throw-out bearing is lubricated for life and requires no further attention. Cut down on the servicing time needed by *your* equipment by specifying this new ROCKFORD Oil Field Type POWER TAKE OFF.

Small Spring Loaded

Heavy Duty Spring Loaded

Oil or Dry Multiple Disc

Heavy Duty Over Center

Power Take-Offs

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SEND FOR THIS HANDY BULLETIN
Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

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CLUTCHES

industry news

AiResearch Ground Support Unit For Propjet

A multi-purpose, flyweight gas-turbine engine mounted on a panel truck will be used as a ground-support unit for Eastern Air Lines' new propjet Electra airplanes.

The unit, made by The Garrett Corp. AiResearch Div., supplies power to (1) keep air conditioning and lighting systems in operation while the plane is on the ground (2) check out radio and hydraulic systems quickly prior to take off, and (3) pneumatically start the plane's propjet engines in a minimum of time to help insure on-time departures.

Eastern has ordered 43 of these panel truck-mounted turbine engines and nine additional engines for use as spares and flyaway units.

Kits Tailor Cooling System To Climate

Neither extreme heat nor extreme cold weather will hamper operation of the locomotive cooling water system equipped with Alco's new specialty kits for severe weather conditions. These kits are designed for locomotives with Model 539 engines. They provide the extra cooling system response needed for severe climates. Engine water temperature constantly remains within the correct operating range.

Combustion efficiency is dependent on this maintenance of correct water temperature. With good combustion, smoke and gassing are greatly reduced, and engine life is lengthened because carbon build-up and lube oil dilution are decreased. Maintenance of proper water temperature also helps provide the correct operating cab temperature, adding to operating crew comfort in cold weather.

Hall-Toledo To Exhibit in IASI Show

Hall-Toledo will exhibit its complete line of equipment, parts, and accessories at the annual International Automotive Services Industries Show in Chicago on February 18-21.

Their display will feature the new Model MR valve seat inserter and valve guide reamer and the improved Model EJ Eccentric Valve Seat Grinder.

The valve seat inserter and valve guide reamer will ream valve guides oversize to the engine manufacturers specifications and will counterbore the head or block for the installation of a new valve seat ring with diameter ranges of 7/8 to 3-5/16-in.

The eccentric valve seat grinder uses a new improved micrometer feed screw mechanism. The operator has complete control of the rate of grind at all times.

Automotive-Type Gas Turbine To Be Produced By Allison

A compact, lightweight automotive-type gas-turbine engine developing 225 hp is being made available to military and commercial users of heavy-duty equipment by the Allison Division of GM. Prototype models have been ordered by several major equipment builders for delivery in 1959.

The engine was developed by GM Research Laboratories and originally installed in the Firebird II and III GM "show cars." Responsibility for further development and protection of the GMT-305 "Whirlfire" has now been transferred to Allison.

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Joseph Lucas (Canada) Ltd. *Head Office:* 11 Davies Avenue, Toronto 8, Ontario
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AP 903

The Whirlfire is reported to be fully competitive with the best gasoline engines and Allison predicts that it will soon be competitive with diesels.

The "Whirlfire" will be available for installation in heavy-duty on-highway and off-highway vehicles, prime movers, military and marine applications and stationary power plants.

ASME Lubrication Division Annual Spring Conference

The annual Spring Conference of the ASME Lubrication Division will be held this year on March 16th and 17th at the Franklin Institute in Philadelphia.

The general subject of the conference is "Wear of Lubricated Surfaces." Three of the sessions of this conference will be conducted as a symposium and formal papers will be presented at one session.

Diesels Power Fire Trucks

The hometown of Cummins diesel has a diesel-powered fire department. Cummins engines in fire truck service include a model HR in a Stutz 1000-gal pumper, a JT-6-B in a Seagrave aerial-ladder truck, and an NH-220 in a Maxim 1000-gal pumper. Fire Chief Owens reports that the diesels save about 50% in operational costs compared with the gasoline engines previously used.

To Correct An Error

The new product item on Springfield "400" Teflon hose assemblies appearing in our December 1958 issue should have listed the temperature range of the hose as minus 65°F to 400°F.

Correction

In the article "Plan Now For Future Flood Control" appearing in the November 1958 edition of Diesel Power, it was inadvertantly stated that the three latest Caterpillar diesel-driven pumps purchased were made by DeLaval. The fact is that although there are three Cat diesel-driven DeLaval pumps, the latest pumps installed were made by Morris Machine Works.

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Look what Morco's **complete reconditioning service offers you!**

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new products

Fram Air Filter Has Precleaner Cartridge

Fram's new HD series air filters with precleaner cartridges feature eight models covering engines with air requirements from 200 to 1000 cfm.

Each filter contains two different types of cartridges which work in series. Dirty air enters the inlet opening in the side of the filter. It then goes through the precleaner cartridge made of synthetic fiber batt material. Soot and fine dust is removed by the precleaner, protecting the inner Filtronic paper cartridge, thus extending its life. Air continues through to inner paper cartridge where other impurities are removed with a reported efficiency of 99% plus.

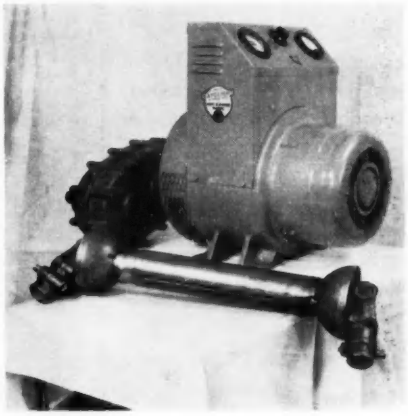
It is not necessary to change the paper cartridge each time the filter needs service. Only the precleaner is changed in a matter of seconds. Tests show that an average of three precleaner cartridges may be used before the paper cartridge needs cleaning or eventual replacement.

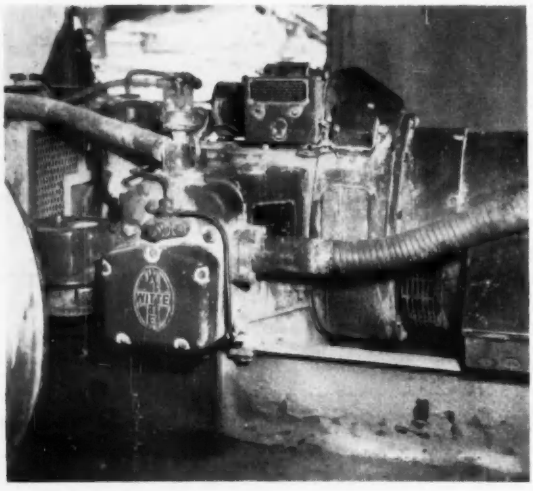
Brushless Tractor-Drive Emergency Generator

Katolight Corp., Mankato, Minn., is marketing a new series of a-c generators designed for tractor-drive farm emergency application. Sizes are 7.5 and 15 kw 115/230 v.

The generator features new brushless construction, life grease-sealed ball bearing and drip-proof construction. It also has a heavy-duty control box. This is complete with field rheostat, voltmeter, frequency meter and an automatic voltage regulator providing excellent motor starting ability and holding voltage within safe limits.

The generators are adaptable to both belt and power take-off drive. With the latter, gearbox and drive shaft can be readily attached in the field. PTO models can also be supplied on a rugged steel trailer.





New Witte Diesel-Generator Set

At Midwest Pre-Cote Company's asphalt plant near Lenera, Kan., a newcomer to the road building materials field is demonstrating its usefulness. It is a Witte 12-kw diesel-generator unit, made by the Witte Engine Works of U. S. Steel's Oil Well Supply Div.

This Witte Model 100RDA is the only source of electric power at this plant. The generator, driven by a 2-cyl, 4-cycle, horizontally-opposed, water-cooled, heavy-duty diesel, provides electricity 24 hours a day, 6 days a week for lighting; radio communications; blower motor for oil-fired heater; 3-hp motor-driven pump for heating asphalt tanks; and 2-hp motor for sand conveyor.

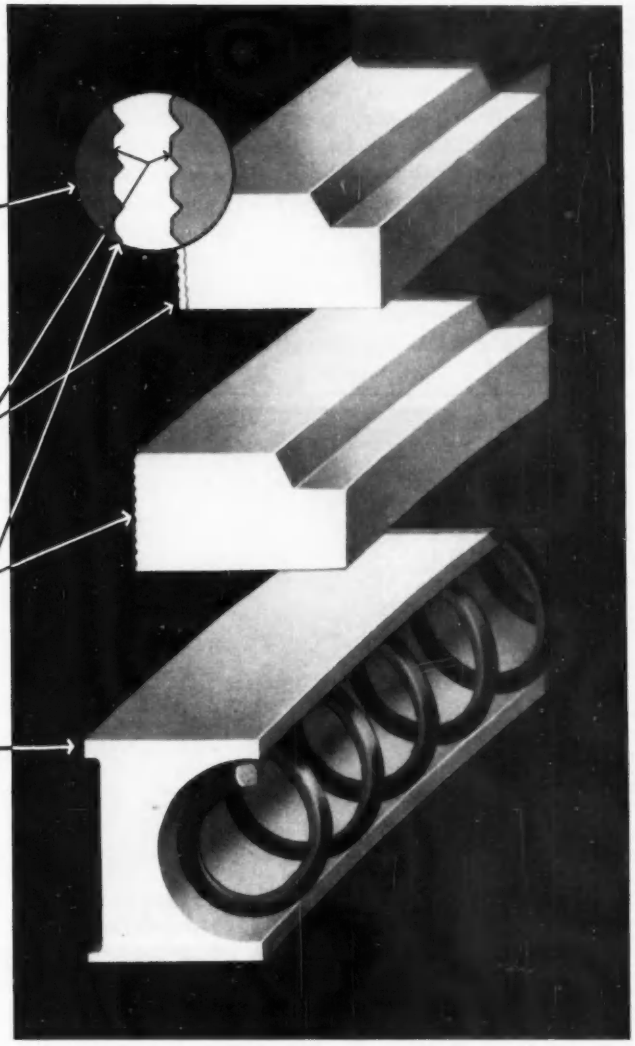
Being almost vibration-free, the unit has little or no hold-down attachments. This facilitates quick removal when batching plants change locations.

(*Continued on Page* 42)

How Perfect Circles are engineered for

SEVERE DIESEL SERVICE

Precise pressure and pre-seated hard, solid chrome doubles life of rings and cylinders.



PRECISE CONTROL
of correct ring pressure distribution for any particular type engine *plus* a pre-seated surface on ring face assures long life and eliminates tedious break-in period.

SOLID HARD CHROME PLATING
on face of compression ring reduces the rate of wear to one-fourth that of unplated rings.

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on compression ring, tailored to specific applications, prevents blow-by and scuffing, yet provides immediate oil control.

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PERFECT CIRCLE

PISTON RINGS AND POWER SERVICE PRODUCTS

Hagerstown, Indiana — Don Mills, Ontario, Canada

new products

(*Continued from Page 40*)

Starting Fluid Applicator

The principle of the Instanstart Applicator recently introduced by the Spray Products Corp. is a sealed connection from the tip of the Spray Starting Fluid can to a tubing which conducts fluid to the atomizer in the intake manifold. The valve of the pressurized can is depressed by distant control through a cable and a pull knob.

The advantage of this closed system is that all of the fluid released is introduced into the engine. The operator is not affected by ether fumes, and no dust or dirt can get into the cylinder with the starting fluid. The pull knob is mounted on the dash board or other convenient place within easy reach of the operator.

The Applicator takes the standard Spray Starting Fluid cans. A toggle latch mechanism locks the can in place.

Kato Static Exciter-Magnetic Amplifier Regulator Units

Kato Engineering Co. of Mankato, Minn., has developed static exciter and magnetic amplifier type voltage regulator units. These enable the company to supply the best possible generator or motor control systems for each application.

The single-unit static exciter-regulators replace both the conventional rotating exciters and electro-mechanical types of regulators.

Flow Indicator Has Adjustable Range

A new Arkon flow indicator made by McIntosh Equipment Corp., N.Y.C., shows at a glance whether flow is taking place. It is said to be clearly visible from a distance even in a bad light. A chromium-plated ring spinning under a glass dome has definite movement which precludes chance of misreading.

Specific applications would be for checking water and oil flow in diesels and in other cases where positive indication of fluid flow is needed.

SAFE
DEPENDABLE GENERATOR OPERATION
Spark Free!
EXPLOSION RESISTANT
KATO
Adaptable To Any Industrial Engine!
Kato's complete line of 50, 60 and 400 cycle revolving field AC Generators is now available in brushless design.
Especially desirable for operation in gaseous environments.
GREATLY REDUCED MAINTENANCE!
KATO BRUSHLESS AC GENERATORS
60 CYCLE SIZES
3 Phase: 5 to 400 KW
1 Phase: 5 to 150 KW
SPEEDS
720, 900, 1200, 1800 RPM.
Take your choice throughout the Kato Line—Brushless or standard slip ring types. For all your 400 cycle or power converting needs investigate Kato's complete line of high frequency alternators and motor generator sets. Complete control systems for all Kato products include Kato magnetic amplifier voltage regulators, static exciters and motor starters for synchronous or induction motors.
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Write For It Today!
KATO
ENGINEERING COMPANY
Builders of Fine Rotating Electrical Machinery Since 1928
1408 FIRST AVENUE, MANKATO, MINNESOTA — PHONE 8-2941

'New Look' Mack Transit Bus

Mack Trucks, Inc., has developed a "new look" transit bus. It is sharply changed in appearance from the conventional design. It has a large wrap-around windshield, dual headlights and a lower silhouette. It is powered by Mack's Thermodyne diesel.

The new unit was designed to fill the demand to improve the general appearance of transit busses as well as front-end vision, an added safety measure.

It features the Mack Airglide suspension system to provide greater riding comfort and offers the new Mack air-conditioning system as optional equipment.

Devcon F-2, Liquid Aluminum

A liquid aluminum material that can be cast without heat or pressure has been developed by Devcon Corp., Danvers, Mass. Called Devcon F-2, this material becomes liquid upon adding a hardening agent. Two hours after the hardener is added, the Devcon F-2 becomes a tough, durable, metallic mass that is similar in appearance to aluminum or steel.

Its uses include: filling blow holes in casting; filling incorrectly drilled holes; building up worn sections on cast or machined parts; and making of jigs, fixtures, dies and other industrial tools.

Sioux ¾-in. Air Impact Wrench

Albertson & Co., Inc., Sioux City, Iowa, have introduced their new ¾-in. Model No. 320, air impact wrench. With 90-psi air pressure the wrench is rated at 700 ft lb of torque. This is said to be an outstanding torque rating for this size wrench.

The No. 320 is the first of many new models and sizes which are being added to the Sioux Air Impact Wrench Line.

Sinclair's New Starting Fluid Aerosol Container

The Sinclair Refining Co. has introduced a new aerosol type container for their starting fluid. This new type container allows application to all types of diesels in year-round service. A special gas propellant is used to give maximum positive discharge pressure at below-freezing temperatures.

The starting fluid is sprayed into the air filters or intake manifolds. Rapid starts are said to be assured at temperatures as low as Minus 65°F. Sinclair starting fluid is a select blend of petroleum hydrocarbons and other special compounds. This combination gives trigger-fast ignition plus smoother sustained burning. This eliminates the possibility of destructive detonation.

Columbia Makes Larger D-C Generators

With addition of its new Series 4230 d-c frame, Columbia Electric Mfg. Co., can now supply d-c generators up to 300 kw at 1200 rpm, either 2-wire 250-v, 3-wire 125/250-v, or 600-v.

The new generators are of bracket ball bearing design and feature all-steel fabricated construction. Machines are available as single or 2-bearing units, shunt or compound wound.

Units are available for diesel engine drive or can be furnished as complete induction or synchronous motor-generator sets.

Safety Industries' New Power System

A new 25 kw, 125-v, d-c power supply system, incorporating generator, exciter and semi-transistorized generator regulator has been developed by the Electrical Div. of Safety Industries, Inc., New Haven, Conn. It offers exceptional response to load fluctuations or rapid changes in generator speed. It is particularly suited for diesel-engine drive wherever rapid acceleration or deceleration is involved.

A separate exciter plus a semi-transistorized generator regulator gives the rapid response which should greatly broaden the scope of utility of diesel-driven d-c generators.

Hydro-Hone Machine For Repair And Service Shops

A new, low-cost, liquid-blasting machine has been designed by the Hydro-Hone Corp. for high production and precision cleaning, finishing, peening, burnishing, and deburring of metal parts. The Model 15 is capable of maintaining micro finishes from 15 to 250 by adjusting air pressures and the size and type of abrasive medias used.

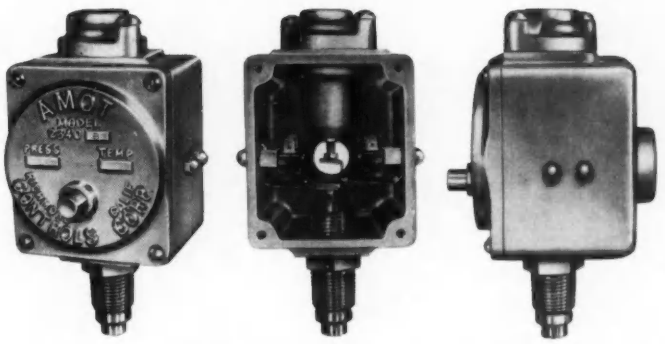
The machine can be adapted to existing air supplies of smaller shops. Internal working area of the unit is 20" x 20" x 20", however, a counter-balanced, side-entry door enables processing of larger parts. Installation area required is 3 sq ft and the height is 72-in.

Trojan Tractor Shovel

To meet the economy needs of contractors and highway officials for equipment capable of multi-purpose operation, the Trojan Div. of The Yale & Towne Mfg. Co. has introduced the Trojan 124. This is a new 4-wheel drive tractor shovel with three interchangeable buckets: a 1½-yd general-utility bucket, a 1¼-yd heavy-material bucket, and a 2-yard light-material bucket. The 10,000-lb lifting capacity of the Model 124 permits it to function at maximum efficiency with any of the three buckets.

The Model 124 is powered by either a GM 3-71, Hercules DD-298 diesel or a Hercules GO-298 gas engine. It is equipped with a planetary torque converter that has 3.5 to 1 torque ratio.

★ SO MUCH PROTECTION AT SO LOW A COST!



The AMOT SAFETY CONTROL SWITCH, Model 2340, illustrated above, is of such high quality and priced so low, that it is suitable for the protection of all Diesels, from the low priced high production models to the largest and most expensive custom built engines. It protects engines against high jacket water temperature and low oil pressure. Model 2340 A, without reset button, is priced at only $30.00. Model 2340 B, illustrated, is $33.50. No where else can you get such positive protection for so long a time at such a low price. Write for Amot Bulletin No. 387.

AMOT CONTROLS CORPORATION
FIRST STREET & NEVIN AVENUE • RICHMOND, CALIFORNIA

people and plants

Howard R. Johnson

Eaton's Valve Division Gets New General Manager

Howard R. Johnson, formerly assistant general manager of the Valve Division, has been promoted to general manager. Harold I. Dyer, who was general manager since 1929 has retired. He will continue in an advisory capacity on matters pertaining to Eaton's new Brazilian subsidiary, Eaton S.A.

Mr. Johnson, 43 years old, joined Eaton in 1946 as a plant engineer. Subsequently, he became factory manager of Foundry, production engineer of the Valve Div., factory manager of this division, and, in 1957, he was named assistant general manager.

American Air Filter Gets New Detroit Representation

A new manufacturers agency, Air Systems, Inc., has been formed by a merger of three Detroit firms. They will market American Air Filter Company's filters for engines and compressors, heating and ventilating and air conditioning products as well as its Illinois Engineering specialties.

All employees of Saunders & Co., Earl W. Graham and American Air Filter's Detroit Branch Office will make up the personnel of Air Systems.

GM Diesel Distributor Expands

Western Services, Inc., Mt. Carmel, Ill., has been appointed as distributor for the Detroit Diesel Engine Div. of GM in 12 additional counties in southwestern Indiana. A complete line of GM engines, parts and service are available on round-the-clock schedule.

Earl L. Fester

Davis Spencer

New President For M-D Blowers

In an executive realignment M-D Blowers, Inc., Racine, Wis., has named Earl L. Fester president. He succeeds George A. Heintzmann who resigned. Davis Spencer, sales manager, has been elected vice president.

M-D Blowers, formerly the Christensen Machine Co., is a wholly-owned subsidiary of Miehle-Goss Dexter, Inc., of Chicago, and is producing rotary blowers and turbochargers.

QUICK STARTS FOR COLD ENGINES* ALL YEAR . . .

DOWN TO 65° BELOW ZERO

Starting a cold engine without SPRAY STARTING FLUID is costly. Constant wear of the starting system . . . wasted man hours . . . equipment down-time . . . repeated engine strain, can be prevented with a pressurized can of SPRAY STARTING FLUID. It's so easy to use! Apply SPRAY STARTING FLUID into the air cleaner or intake air stream while cranking the engine. Continue spraying until the engine runs smoothly. Use SPRAY STARTING FLUID regularly for quick, easy and economical starting of diesel and gasoline engines. Start every work day with SPRAY!

*Until the engine reaches normal operating temperature it is a cold engine.

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Excessive smoking in Diesel equipment usually indicates faulty engine operation. However, it is difficult to *accurately* guage exhaust smoke density by visual observation.

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The HARTRIDGE SMOKEMETER can be used to test *mobile* or *stationary* engines of all sizes, through all speed and load ranges.

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Diesel piston before removing caked carbon and film.

The same piston after soak cleaning with LIX Diesel cleaner.

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LIX DIESEL CLEANERS

For cleaning **today's** diesels, you need a **modern** diesel cleaner. LIX Diesel Cleaners are so effective—so **sure**, so **fast** in action—that cleaning time is cut to the very minimum. Lix **soaks** away every bit of grease, grime and caked carbon from lube oil coolers, torque converters, etc.—you don't have to brush or scrape even the dirtiest parts. Lix Diesel Cleaners are **harmless** to all metals including aluminum and brass . . . **safer** (low in toxicity, and not a fire hazard) . . . and **last longer** without frequent charges.

Whatever your diesel cleaning job, there's a LIX Diesel Cleaner for it—**spray** or **soak tank** types, **electric equipment** cleaners . . . **NON-CHLORINATED.**

Write or telephone for literature covering your particular needs.

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For Testing all Unit Injectors in One Fixture. Makes Plunger and Bushing Tests on all General Motors Unit Injectors.

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SAVE DOWN TIME

Write for Bulletins KTP-50 and UTS-10

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C. A. Weaver

D. E. Dixon

E. J. Willson

T. D. Hess

Cooper-Bessemer Changes

C. A. Weaver has been appointed service manager of the Tulsa field office of the Cooper-Bessemer Corp. He joined G-B in 1951.

Mr. Weaver will now be directly responsible for all operations of the company's equipment in the greater Tulsa area.

Donald E. Dixon has rejoined C-B. Presently assigned to the Turbo-Compressor Group, he will ultimately join one of the regional field offices with responsibility for application and sale of engines and compressors.

Mr. Dixon became associated with C-B in 1952 and was later promoted to manager, Compressor Section Sales. He was then appointed to the Tulsa office.

Promotions At Hartford Machine Screw Co.

Ernest J. Willson is now engineering manager of the Fuel Injection Div. of the Hartford Machine Screw Co., Hartford, Conn. He joined the company in 1947. He became a field engineer and had charge of application work for the RoosaMaster fuel injection pump. Later he was advanced to development engineer in charge of the Development Section.

Mr. Willson is a member of the SAE serving on its Diesel Engine Activities Committee.

Thomas D. Hess will fill the position of chief development engineer vacated by Willson. He joined the company in 1956 as a field engineer in the Fuel Injection Div. He too is a member of the SAE.

New A-C Construction Machinery Sales Mgr.

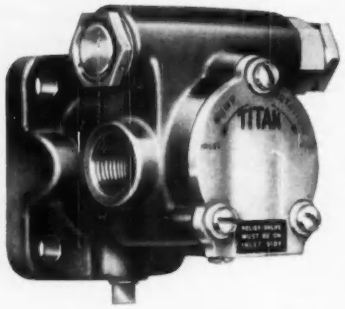
N. K. Helding is now construction machinery sales manager of the Allis-Chalmers Syracuse (N. Y.) branch. He joined the branch as assistant construction machinery sales manager last November. He has been with A-C since 1954.

New Burgess-Manning Representatives

The Lynn McGuffy Co., Inc. Shreveport, La., are now sales representatives of the Industrial Silencer Div. of Burgess-Manning Co. As such, they will sell Burgess-Manning snubbers for eliminating pulsation in gas pipe line systems and excessive intake and exhaust noise from internal combustion engines, compressors, blowers, etc.

They will represent B-M in southern Arkansas, northern Louisiana and northern Mississippi.

BILLION MILE CHAMP



Typical Diesel Pump

Series 5501. Rated capacity: 200 gph. Discharge pressure range up to 20 psi. 11-tooth spline or ¼" square drive tang; rotatable or square mounting flange. Weight with fixed pressure type relief valve: 1.8 lbs.

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Positive Displacement
Rotary **Fuel Pumps**

Among the horsepower "heavyweights" where fuel economy is dollar-and-cents business, TITAN FUEL PUMPS have hung up a performance record hard to beat. Specified as *original equipment* on hundreds of thousands of aircraft, trucks, buses and stationary diesels, Titan Pumps have accounted for billions of low-cost, trouble-free payload miles. High quality is one reason. Another is proven, simple, low-maintenance design. For a convincing pump demonstration call us — or write your engine manufacturer.

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Pumps for any Engine Design • Most Fuels • And a Variety of Engine Mounting and Drive Conditions

new literature

Kato Brushless Generator

Kato's latest product bulletin Form ACG958 describes the construction, sizes, performance, and other features of their generators. Emphasis is placed on their newly-developed complete line of brushless alternators.

The 16-page booklet shows in detail the construction of these brushless generators by large cutaway photos. Various arrangements as used in different applications are also illustrated.

A-C's New Integral-Shaft Sheave Described

Construction and operating features of "Vari-Pitch" integral shaft sheaves for low-cost stepless speed control in large machine drives are given in a new bulletin released by Allis-Chalmers.

These sheaves provide a wide range of speeds, infinite speed variations, and accurate speed control while the drive is in motion. The integral-shaft design permits mounting the sheave between two pillow blocks for rigid support and is said to provide a flexibility to meet almost any drive requirement.

The bulletin, 20B7897B describes how integral-shaft sheaves are available with lubrication systems designed and engineered to assure distribution of lubricants to all moving parts.

High-Speed Generators

Electric Machinery Mfg. Co. publication 2100-PRD-250 describes a line of standard, high-speed generators. These are available from 3.75 thru 62.5 kva, 60 or 50 cycle, single or three phase, in all standard voltages below 600, both in single or two-bearing construction.

These E-M generators are of the revolving-field type with direct connected d-c exciters. They can be furnished as packaged units complete with built-in automatic voltage regulators.

Brochure On "110" Diesels For Logging Trucks

An illustrated brochure describing its heavy-duty Series 110 diesels for logging trucks has been released by the Detroit Diesel Engine Division of GM.

The booklet lists advantages of GM diesel 2-cycle design which they claim contributes to more efficient, profitable hauling operations. It also covers outstanding results of a 6-110 logging truck engine on rugged hauling operations in mountain regions of California. Power curves and engine specifications are included.

Facts About Ni-Resist Irons

"Engineering Properties of Ni-Resist Ductile Irons", is the title of a new 28-page booklet containing the full story of this unique, new cast metal that combines high strength and toughness with high resistance to heat, wear and corrosion. It is issued by the Nickel Information Service of The International Nickel Co., Inc.

Tables and graphs explain mechanical and physical properties, erosion and corrosion resistance and high temperature strength. A special section points out many proven industrial applications of Ni-Resist ductile irons.

Drill Stands Held Magnetically

A new bulletin on the use and applications of magnetic drill stands is available from the Thor Power Tool Co. This firm recently introduced three new magnetic drill presses for use with air electric drills up to 2-in. capacity.

The bulletin, Thor No. 10406, describes precision drilling possibilities in difficult or remote areas using magnetic drill stands whose base "locks" to any ferrous surface. It also explains how dismantling heavy machinery or building expensive rigging for drilling work can be avoided with magnetic stands.

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Hydraulic Hose And Tube Assemblies

Technical Bulletin 100, describing medium pressure hydraulic hose and tube assemblies, is now available from the Eastman Mfg. Co.

This 36-page bulletin covers exclusive Eastman features found in medium to low pressure hydraulic hose and tube assemblies, with accurate dimensional drawings and complete tables of available sizes.

Those who have received the Eastman Technical Bulletin on high pressure assemblies—will also want to include this new technical bulletin 100 in their files.

Tungsten Carbide Sprayed For Hard Facing

A new spray-powder material has been developed by Metallizing Engineering Co., Inc. When sprayed through a Metco ThermoSpray Gun it is said to permit hard facing with sprayed tungsten carbide at over 90% deposit efficiency. Coating speeds are also high. Any required coating thickness may be applied.

Metco expects that the new process will find wide application on parts such as used on construction equipment which are subject to extreme wear conditions.

Engineering Bulletin 139 describes the process in detail and shows typical parts which have been hard-faced.

High-Speed Photography Helps Develop Impact Wrench

High-speed photography in conjunction with an extensive study of tool impacting operations has led to development of a new impact wrench, by the Gardner-Denver Co. Analysis of the speed films revealed some unknown data that resulted in the designing of an entirely new impacting mechanism and the new wrench.

The new wrench is available in two models. Both are rated at ¾-in. nut-setting capacity. Complete information is available in Bulletin 18-11.

Hercules Issues Spanish-Language Engine Chart

A comprehensive 2-page engine chart has been issued by Hercules Motors Corp. This is the first of its kind written in Spanish by this manufacturer. The new chart lists Hercules' line of air-cooled and liquid-cooled diesel and LPG engines and power units for automotive and industrial equipment up to 475 hp.

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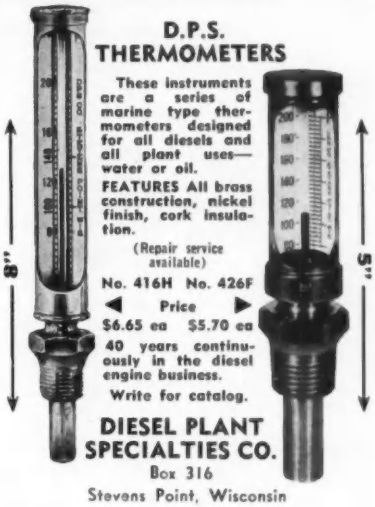
Aggressive, Fast Growing Organization needs qualified man to cover Southeastern Ohio and Southwestern West Virginia selling General Motors Diesel Engines. Outstanding opportunity if you are qualified, willing to work and travel. Address replies to Box Number RC2-592, c/o Diesel Power, 80 Lincoln Ave., Stamford, Conn. giving complete personal resume.



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FEATURES All brass construction, nickel finish, cork insulation.

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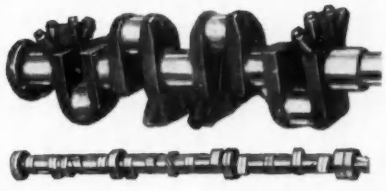

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Wix Corporation 15

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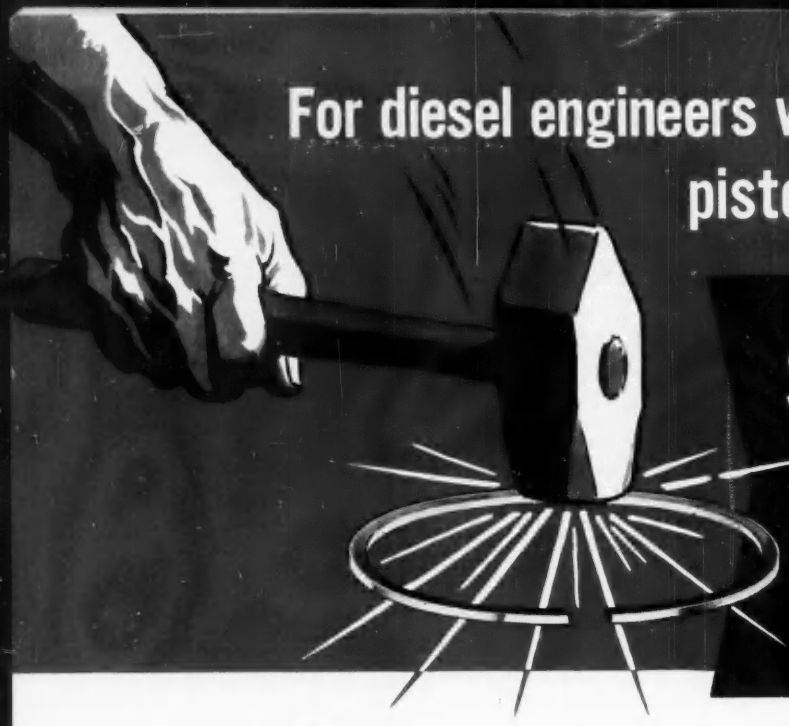

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